

**SPECIAL INSPECTIONS:
IMPLEMENTATION IN FAIRFAX COUNTY**

2000 Edition

Effective: October 1, 2003

**Based on Virginia Uniform Statewide Building Code (2000) Edition,
13 VAC 5-62-10 et seq., effective October 1, 2003**



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The staff of Land Development Services, Department of Public Works and Environmental Services, expresses our appreciation for the valuable assistance of all of the individuals and organizations who contributed to the creation of ***Special Inspections: Implementation in Fairfax County - 2000 Edition***.

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October 1, 2003

PREFACE TO THE SIFC-2000

The new *Virginia Uniform Statewide Building Code* edition, effective October 1, 2003, (**VUSBC(2000)**, or **VUSBC**), incorporates and amends the International Code Council, Inc. (ICC) *2000 International Building Code*, including portions of the *2001* and *2002 Supplements* (**IBC-2000**, or **IBC**).

Special Inspections: Implementation in Fairfax County - 2000 Edition, effective October 1, 2003, (**SIFC-2000**), implements the Fairfax County Special Inspections Program procedures for special inspections that are required by the **VUSBC(2000)** and **IBC-2000**. This SIFC-2000 is intended to be useable in offices and on the job site by containing the pertinent information needed for successful application of the special inspections program, but it is not a replacement for the governing codes, nor is it a library of all referenced standards.

The procedures of the special inspections program have “**SIFC-mm.nn**” section numbers. The VUSBC and IBC building code sections that are included in each chapter have a different font, with “**VUSBC-mm.nn**” and “**IBC-mm.nn**” section numbers, respectively, which should help in reading and applying the program and the building code. Individuals such as the Owner are shown in bold type to emphasize their roles and responsibilities. Examples:

“**SIFC-301.1 Required by VUSBC and IBC.** The VUSBC requires special inspections for ...” (SIFC-2000 language)

“**VUSBC-1704.1 General.** Where application is made for construction as described in this section, the **Owner** or the **RDP** in responsible charge ...” (VUSBC language)

Several additional changes are summarized below.

Chapter 1, The Fairfax County Special Inspections Program. The description of “special inspections and materials testing” has been changed from “...ensure adequacy...” to “...substantiate adequacy...”. The inspection and testing agency shall meet ASTM E 329 requirements. The Special Inspections Engineer of Record is responsible for the inspection and testing agency’s work, whether directly supervising it or not. Both parties are subject to County approval, and the FCCSS role is to confirm their work. The appropriate registered design professionals of record shall review and approve the final report of special inspections before its submission for FCCSS review and approval.

Chapter 2, Definitions and Abbreviations. Revises several definitions and includes definitions from SIFC-2000, IBC and VUSBC. Includes contact information for standards promulgating organizations (addresses, telephone numbers and web sites).

“Completion letter” and “Final report of special inspections”. To clarify the scope and timing of special inspections, these definitions now include the phrases “...special inspections as identified in the statement of special inspections...” and “...materials or phases of construction have been inspected prior to concealment...”.

“Inspection and testing agency”. To be approved, an inspection and testing agency must be accredited and meet the requirements of ASTM E 329.

“Special inspection”. A new sentence, “...In this context, ‘ensure’ means ‘substantiate’...”, clarifies the intent of both the SIFC-2000 and IBC definitions.

Chapter 3, Special Inspections Classifications. Includes VUSBC-1704.1 *General*, IBC-1704.2 *Inspection of fabricators*, and Code of Virginia § 54.1-400 et seq. Requirements for professional design of buildings. Seismic classifications are revised. Cast-in-place concrete includes a sentence on “stable” ground support. New classifications are added for sprayed fire-resistant material, smoke control, and mechanical, electrical and plumbing components, and the Statement of Special Inspections form has the new classifications.

Chapter 5, Special Inspections and Testing Services. New language specifies the approval process for changes in construction team. Design revisions with associated document revisions, such as field change orders, shall be in writing and approved. The distribution of special inspection reports is clarified. The SIER has the duty to report observed code violations or job site safety violations, but is not liable for other parties. Each laboratory must be accredited; added criteria for on-site laboratory approval.

Chapter 6, Structural Steel. IBC-1704.3 *Steel construction* is included. “Spray-on-fireproofing” has moved to new Chapter 14.

Chapter 7, Cast-in-Place Concrete. IBC-1704.4 *Concrete construction* and IBC-Table 1704.4, as amended by VUSBC(2000), are included. Special inspection of concrete formwork, shoring and reshoring is still (and will remain) within special inspections. Includes IBC-1906.6 for acceptance of concrete. Cold-weather concreting has been revised for clarity on storage locations of field cylinders, and frequency of temperature readings.

Chapter 8, Precast Concrete. Explicitly refers to IBC.

Chapter 9, Wood. Revised to include IBC-1704.6 *Wood construction*, with SIFC-2000 requirements for fabrication and erection documents, inspection of wood fabricators and inspection of seismic connections.

Chapter 10, Masonry. Now includes VOSHA requirements for construction bracing of masonry walls. Special inspections are classified by kind of facility (“essential” vs. “non-essential”) and type of structural design, with required inspections listed in new IBC tables. SIFC-2000 requirements for cold-weather and hot-weather construction have been revised to include IBC Chapter 21 requirements.

Chapter 11, Soils and Foundations. Includes IBC-1704.7, IBC-1704.8 and IBC-1704.9, and specifically refers to sections in IBC Chapter 18.

Chapter 13, Exterior Insulation and Finish Systems. The IBC scope of EIFS systems which require special inspections is different from that in the previous code.

Chapter 14, Sprayed fire-resistant materials, Chapter 15, Smoke control systems, and Chapter 16, Mechanical, electrical and plumbing components. New chapters, including IBC requirements for special inspection of these items.

Chapter 17, Safeguards During Construction. Relocated and retitled, combining two chapters of previous edition. Protection of the public requires safe storage of construction materials, exits from occupied buildings to be kept usable, and includes fencing, barriers and covered walkways. Tower cranes, personnel and material hoists, and construction elevators are included. Fire protection (fire extinguishers, standpipes, sprinklers, fire watch timing) is revised. Includes completion requirements for new buildings and tenant areas.

Appendix A, VUSBC(2000) Excerpts. New appendix: Amendments to IBC Chapter 17.

Appendix B, IBC-2000 Excerpts. New appendix: IBC Chapter 17.

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CHAPTER 1 THE FAIRFAX COUNTY SPECIAL INSPECTIONS PROGRAM

SIFC-101 INTRODUCTION

SIFC-101.1 Special inspections required. The Fairfax County Special Inspections Program (formerly called the Critical Structures Program) was established by the Fairfax County Board of Supervisors in 1973, after the collapse of a 26-story concrete structure under construction, to monitor high-rise construction projects in Fairfax County. Since 1973, the Program has evolved to encompass all major commercial construction projects, and major residential construction projects other than single-family homes and townhouses. The Special Inspections Program is administered by the Fairfax County Critical Structures Section (**FCCSS**) of the Commercial Inspections Division (CID), Land Development Services (LDS), Department of Public Works and Environmental Services (DPWES).

Following the program developed in Fairfax County, special inspections were first incorporated into the Building Officials and Code Administrators International, Inc. (BOCA) National Building Code, and adopted by the Virginia Uniform Statewide Building Code (**VUSBC**) in the 1990 edition. BOCA is now part of the International Code Council, Inc. (ICC), and special inspections are part of the ICC International Building Code.

The new Virginia Uniform Statewide Building Code edition, effective October 1, 2003, (**VUSBC(2000)**, or **VUSBC**), incorporates and amends the ICC *2000 International Building Code*, including portions of the *2001* and *2002 ICC Supplements* (**IBC-2000**, or **IBC**). Revisions have been made to the building code requirements for special inspections.

SIFC-101.2 Content. This document, *Special Inspections: Implementation in Fairfax County - 2000 Edition* (**SIFC-2000**), implements the requirements of **IBC-1704 Special Inspections**, *et. al.*, as amended by the **VUSBC**. The SIFC-2000 includes excerpts of technical requirements of the VUSBC, IBC and their referenced standards, the policies and procedures underpinning the Special Inspections Program in Fairfax County, and descriptions of the roles and responsibilities of all parties involved in special inspections. Procedures of the Special Inspections Program in Fairfax County are identified by “**SIFC-mm.nn**” section numbers. VUSBC and IBC excerpts are identified by “**VUSBC-mm.nn**” and “**IBC-mm.nn**”, respectively.

This SIFC-2000 is only to be used in conjunction with the VUSBC(2000) and IBC-2000.

Construction for which a permit application is submitted after October 1, 2003 shall comply with the provisions of this SIFC-2000, except when construction documents for proposed construction were substantially complete prior to the above date and a permit application is submitted within one year after the above date. In such cases, construction shall comply with either the provisions of this SIFC-2000 or the previous *Special Inspections: Implementation in Fairfax County / 1996 Edition*.

SIFC-101.3 Special inspections and materials testing. The Special Inspections Program is based on the engineering and industry standards adopted by the Virginia Board of Housing and Community Development as a part of the VUSBC. These standards are promulgated by nationally recognized organizations such as the American Iron and Steel Institute (AISI); the American Institute of Steel Construction (AISC); the Portland Cement Association (PCA); the

National Concrete Masonry Association (NCMA); the American Concrete Institute (ACI); and the Brick Industry Association (BIA). The requirements for special inspections and materials testing contained in the VUSBC(2000) and these standards can be categorized as follows:

- Inspections and testing to substantiate adequacy of the fabrication process, e.g., quality of pre-manufactured steel beams.
- Inspections and testing to substantiate adequacy of construction materials and their installation, e.g., strength of cast-in-place concrete.
- Inspections and testing to substantiate adequacy of site construction techniques, e.g., protection of concrete during cold weather periods, quality of field welding of structural connections, etc.

The above standards do not specify who should perform special inspections. The VUSBC gives localities in the Commonwealth two options: utilize municipal code enforcement personnel; or allow a firm independent of the contractor to provide required services. In creating the Special Inspections Program, the latter alternative was chosen for several reasons:

- This alternative provides scheduling flexibility and minimizes delays during the construction process. A contractor does not have to wait for County inspectors to proceed with each stage of construction.
- With the increased level of inspection services provided by a licensed professional, the probability of structural failure is reduced.
- Owners realize cost savings by retaining the engineering firm they deem most qualified to respond to unforeseen circumstances, abide by the owner's construction schedule, and provide special inspection and testing services. The cost of the inspection and testing program is borne directly by the owners of buildings rather than the County.

SIFC-101.4 Purpose. The purpose of the SIFC-2000 is to:

- Clearly define the responsibility of all parties.
- Standardize building code application and implementation.
- Provide for an orderly and systematic approach for updating standards which apply to the Special Inspections Program.
- Apply the Special Inspections Program uniformly throughout Fairfax County.

The SIFC-2000 has chapters and procedural outlines identifying the purpose, team members' responsibilities, time requirements, and scope of various construction activities. The SIFC-2000 applies throughout the life of the project, and a copy of the SIFC-2000 shall be available at the job site from the time of the **FCCSS** preconstruction meeting through final inspections prior to occupancy.

- At the preconstruction meeting, parties to the meeting shall sign an acknowledgment of the **Statement of Special Inspections (SSI)** which identifies the special inspections requirements for the project.
- The provisions of the SIFC-2000 do not relieve any participant from the proper performance of work according to contracts, approved plans and specifications, compliance with the VUSBC and IBC building code requirements, and the applicable federal and state safety regulations.

SIFC-101.5 Alternative inspection methods or material tests. Proposals for alternative special inspections procedures, or alternative testing methods, after review and approval by the appropriate **RDPs**, shall be submitted to **FCCSS**, which will review and approve or disapprove such proposals on a case by case basis. Substantiation of equivalence to the minimum requirements of the Special Inspections Program and this SIFC-2000 shall be provided. If such

proposals include or require requests for building code modifications, the provisions of SIFC-101.6 shall also apply.

SIFC-101.6 Building code modification requests. Requests for building code (VUSBC or IBC) modifications shall be separately submitted to the building official for consideration on a case by case basis in accordance with the provisions of VUSBC-109.2. If such requests include or require alternative special inspections procedures, or alternative testing methods, the provisions of SIFC-101.5 shall also apply.

SIFC-101.7 Program revisions. Revisions to the Special Inspections Program are issued on an as-needed basis:

- Each page shall carry the date of issue as a means of identification. Revisions to the SIFC-2000 resulting from VUSBC revisions by BHCD shall become effective immediately upon issuance. Other proposed revisions shall be advertised for public comments before implementation.
- A cover letter transmitting the new or revised pages shall clearly identify the implementation date and shall indicate where the revisions are to be inserted into the SIFC-2000.

SIFC-102 THE SPECIAL INSPECTIONS ENGINEER OF RECORD

SIFC-102.1 Special inspections services. Under the Special Inspections Program, the **Owner** of a building (or the Owner's duly authorized representative) shall retain an independent registered professional engineer (**RDP**) to be the **Special Inspections Engineer of Record (SIER)** who provides special inspection services as required herein, including responsibility for the services of an **inspection and testing agency** which shall meet the requirements of ASTM E 329. Both the **SIER** and the **inspection and testing agency** shall be independent of the contractors performing the work requiring special inspections. The **SIER** and the **inspection and testing agency** are subject to County approval. The role of County staff is to confirm that the work of the **SIER** and the **inspection and testing agency** complies with the requirements of the Special Inspections Program and this SIFC-2000.

The **SIER** (referred to as "special inspector" in IBC) shall conduct special inspections in accordance with the requirements of the VUSBC, IBC and this SIFC-2000. At the completion of the project, the **SIER** shall prepare a final report of special inspections for review and approval by the **SER**, **AR** and/or **GER**, as appropriate, which shall then be submitted to **FCCSS** for review and approval, prior to final building inspection approval and issuance of a Non-Residential Use Permit (Non-RUP).

SIFC-103 THE STRUCTURAL OR GEOTECHNICAL ENGINEER OF RECORD REVIEW AND APPROVAL STAMP

SIFC-103.1 Stamp on documents. All construction documents, and fabrication and erection documents, required to be reviewed and approved by the **SER** or **GER** (the **AR** if the **AR** is also the **SER** or **GER**) shall bear a review / approval stamp conforming to this section. The requirement for review and approval, and the format of the review / approval stamp, is in addition to the seal and signature requirement for documents required to be prepared by **RDPs**.

Each individual document shall bear the review / approval stamp of the **RDP** or be otherwise individually identified as being reviewed and approved. Submission packages of documents may be accompanied by an index sheet bearing the review / approval stamp and signature of

the **RDP** and specifically listing the documents, and dates thereof, to which the review / approval stamp and signature apply. Subsequent submissions of revised documents shall be reflected on the index sheet.

SIFC-103.2 Format and language. The stamp shall contain language as shown in the examples of acceptable formats. The stamp has three parts:

- (Mandatory) Results of the review in specific terms, with corresponding instructions. The words or phrases "Approved", "Approved as Noted" or "Approved as Corrected", and "Disapproved" shall appear. Words or phrases such as "Reviewed", "No exception taken", etc., are not acceptable. The word "fabrication" can be interchanged with the word "construction."
- (Optional) Clarification statements to explain the scope or qualify the results of review. The text most commonly used by engineering firms includes provisions that the approval is for general conformance with the design intent and the contract requirements, or that the reviewer does not assume responsibility for fabrication or construction processes, or that the contractor is responsible for coordination of trades and satisfactory execution of the work.
- (Mandatory) Signature and date lines. The signatory area shall be completed.

APPROVAL FOR GENERAL COMPLIANCE WITH STRUCTURAL CONTRACT DOCUMENTS	
<input type="checkbox"/> APPROVED	Fabrication may proceed as shown.
<input type="checkbox"/> APPROVED AS CORRECTED	Fabrication may proceed based on corrections indicated.
<input type="checkbox"/> APPROVED AS CORRECTED RESUBMIT FILE COPY	Fabrication may proceed based on corrections indicated. Correct submission and resubmit for record purposes only.
<input type="checkbox"/> DISAPPROVED	Fabrication may not proceed. Correct submission for further review.
<input type="checkbox"/> REVIEWED FOR INFORMATION	Approval not required. Accepted for information purposes only.
Approval is for general compliance with the structural contract documents only. This approval assumes no responsibility for dimension, quantities and conditions that pertain to fabrication and installation or for processes and techniques of construction. The Contractor is responsible for coordination of the work of all trades and the performance of this work in a safe and satisfactory manner.	
BY _____ DATE _____ _____ (NAME OF COMPANY)	

APPROVAL FOR DESIGN CONFORMITY
<input type="checkbox"/> APPROVED <input type="checkbox"/> APPROVED AS NOTED <input type="checkbox"/> REVISE AS NOTED AND RESUBMIT <input type="checkbox"/> REJECTED/RESUBMIT AS SPECIFIED <input type="checkbox"/> FURNISH () CORRECTED COPIES
<p>Notations do not authorize changes to contract sum.</p> <p>Submittal was reviewed for design conformity and general conformance to contract documents only. The Contractor is responsible for confirming and correlating dimensions at job sites for tolerances, clearances, quantities, fabrication processes and techniques of construction, coordination of his work with other trades and full compliance with contract documents.</p>
<p>BY _____</p> <p>DATE _____</p> <p>_____ (NAME OF COMPANY)</p>

APPROVAL FOR DESIGN CONCEPT	
<input type="checkbox"/> APPROVED <input type="checkbox"/> APPROVED AS NOTED <input type="checkbox"/> DISAPPROVED	<p>Final approval. Fabrication may proceed on work as shown.</p> <p>Fabrication may proceed on the basis of corrections indicated.</p> <p>Fabrication may not proceed. Revisions shall be made and submitted for further check.</p>
<p>Approval is only for conformance with the design concept of the project and compliance with the information given in the contract documents. The contractor is responsible for dimensions to be confirmed and correlated at the job sites, for information that pertains solely to the fabrication processes or to techniques of construction, and for the coordination of the work of all trades.</p>	
<p>BY _____</p> <p>DATE _____</p> <p>_____ (NAME OF COMPANY)</p>	

CHAPTER 2 DEFINITIONS AND ABBREVIATIONS

SIFC-201 DEFINITIONS

The following words and terms shall, for the purposes of this SIFC-2000, have the meanings shown in this chapter. Terms not defined in this SIFC-2000 shall have the meanings ascribed to them in the VUSBC and IBC.

Approved. See IBC-202 **Approved**.

Approved agency. See IBC-1702.1 **Approved agency**.

Approved fabricator. See IBC-1702.1 **Approved fabricator**.

Architect of record (AR). The **registered design professional (RDP)** retained by the **Owner** to design or specify architectural construction in accordance with the VUSBC and the Code of the County of Fairfax, and whose signature and seal appear on the County-approved architectural construction documents.

Building. See VUSBC-202 **Building**.

Certificate of compliance. May be issued by corporate officer. See IBC-1702.1 **Certificate of compliance**.

Certification. Shall be issued by **RDP**.

1. A statement by a **RDP** which shall indicate that the item(s) under consideration, in the **RDP's** opinion and to the best of the **RDP's** knowledge, complies with County-approved documents. A certification shall carry the original signature and seal of the **RDP** making the statement; or
 2. A statement by a **RDP** which shall indicate that the item(s) under consideration, in the **RDP's** opinion and to the best of the **RDP's** knowledge, complies with requirements of the VUSBC. A certification shall carry the original signature and seal of the **RDP** making the statement.
-

Completion letter.

1. A certification by the **SIER** which shall indicate that the construction elements subject to special inspections as identified in the County-approved statement of special inspections for a specific material or phase of construction have been inspected prior to concealment, and in the **SIER's** professional opinion and to the best of the **SIER's** knowledge, complies with County-approved documents and project specifications. A completion letter shall carry the original signature and seal of the **SIER** making the statement; or
 2. A certification by the **GER** which shall indicate that the construction elements subject to special inspections as identified in the County-approved statement of special inspections for a specific material or phase of construction have been inspected prior to concealment, and in the **GER's** professional opinion and to the best of the **GER's** knowledge, complies with County-approved documents and project specifications. A completion letter shall carry the original signature and seal of the **GER** making the statement.
-

Construction documents. Documents prepared for the purpose of obtaining a building permit. See IBC-202 **Construction documents**.

County-approved documents.

1. Building construction documents as approved by the **BPRD** including all approved revisions;
 2. Fabrication and erection documents as approved by **FCCSS** including all approved revisions;
 3. Soils-related documents as approved by the EFRD including all approved revisions.
-

Critical structure. See **Special inspections project**.

Fabricated item. See IBC-1702.1 **Fabricated item**.

Fabrication and erection documents. All of the written, graphic and pictorial documents prepared or assembled after issuance of a building permit and in addition to the County-approved construction documents, describing the design, location and physical characteristics of the building components or materials necessary for fabrication, assembly or erection of the elements of the project.

Final report of special inspections. A certification by the **SIER** which shall indicate that all construction elements subject to special inspections as identified in the County-approved statement of special inspections for all materials or phases of construction have been inspected prior to concealment, and in the **SIER's** professional opinion and to the best of the **SIER's** knowledge, a construction project complies with County-approved documents and project specifications. The final report of special inspections shall carry the original signature and seal of the **SIER** making the statement.

Geotechnical engineer of record (GER). The **RDP** retained by the **Owner** to design or specify earthwork and foundations in accordance with the VUSBC, the Code of the County of Fairfax and the Fairfax County Public Facilities Manual, and whose seal and signature appear on the County-approved geotechnical report.

Inspection. The continuous or periodic observation of work and the performance of tests for certain building or structure components to establish conformance with County-approved documents as required by the VUSBC, IBC and this SIFC-2000.

Inspection certificate. See IBC-1702.1 **Inspection certificate**.

Inspection and testing agency. An established and recognized agency or agencies, meeting the requirements of ASTM E 329 and accredited, retained by the **Owner**, independent of the contractors performing the work subject to special inspections, and approved by **FCCSS** to perform special inspections and materials testing required by the VUSBC, IBC and this SIFC-2000. See IBC-1702.1 **Approved agency**.

Label. See IBC-1702.1 **Label**.

Manufacturer's designation. See IBC-1702.1 **Manufacturer's designation**.

Mark. See IBC-1702.1 **Mark**.

Non-Residential Use Permit (Non-RUP). Certificate of occupancy, issued by the Fairfax County Zoning Administration Division of the Office of Comprehensive Planning pursuant to the Fairfax County Zoning Ordinance (Chapter 112 of the Code of the County of Fairfax). A Non-RUP issued for a building shell indicates that construction of a new building has been completed in compliance with all Fairfax County requirements. A Non-RUP for a specific tenant indicates that construction of this tenant's space has been completed in compliance with all Fairfax County requirements, and can be occupied.

Non-structural elements. Elements of a building that are not primary or secondary structural elements. Examples include exterior curtain walls and cladding, nonloadbearing partitions, stair railings, etc.

Owner. The word "owner" shall be construed as though followed by the words "or the owner's duly authorized representative". See VUSBC-202 **Owner**.

Pre-engineered structural elements. Structural elements specified by the **SER** but which may be designed by a specialty **RDP**. Examples are items such as open web steel joists and joist girders; wood trusses; combination wood, metal and plywood joists; precast concrete elements; prefabricated wood or metal buildings; tilt-up concrete panel reinforcement and lifting hardware.

Primary structural system. The combination of elements which serve to support the weight of the building's structural shell, the applicable live loads based upon use and occupancy, and wind, snow, thermal and seismic environmental loads. Items such as curtain wall members, nonloadbearing walls, or exterior facades are not part of the primary structural system.

Registered design professional (RDP). A professional architect or professional engineer licensed in the Commonwealth of Virginia (see Code of Virginia, § 54-1). See VUSBC-202

Registered design professional.

Reshores. See IBC-1902.1 **Reshores**.

Secondary structural elements. Building elements that are structurally significant for the function they serve but are not necessary for stability of the primary structure. Examples include: support beams above the primary roof structure which carry a chiller; elevator support rails and beams; retaining walls independent of the primary building; flagpole or light pole foundations; falsework required for the erection of the primary structural system; steel stairs or railings; etc., not fully specified on the County-approved construction documents.

Shall. This term, where used in this SIFC-2000, indicates mandatory requirements.

Shores. See IBC-1902.1 **Shores**.

Special inspection. Inspection or testing of building components requiring special expertise to “ensure” compliance with County-approved documents and VUSBC and IBC requirements. In this context, “ensure” means “substantiate”. See also IBC-1702.1 **Special inspection**.

Special inspections engineer of record (SIER). Referred to as “Special inspector” in IBC, the **RDP** who is directly responsible for special inspections, materials testing and related services as described in the County-approved Statement of Special Inspections and this SIFC-2000. The **SIER** shall be retained by the **Owner**, independent of the contractors performing the work subject to special inspections, and approved by **FCCSS** to perform special inspections.

Special Inspections Program, Fairfax County. The administrative procedures of the Critical Structures Section, DPWES, Fairfax County, Virginia (**FCCSS**), for construction projects subject to special inspections during construction, in accordance with the VUSBC and IBC. The requirements of the Fairfax County Special Inspections Program are contained in this document, *Special Inspections: Implementation in Fairfax County - 2000 Edition* (SIFC-2000).

Special inspections project. A building or structure to be constructed or altered under the Fairfax County Special Inspections Program.

Statement of Special Inspections (SSI). The Statement of Special Inspections is a statement prepared by the **Owner** and the appropriate **RDPs** of record (**AR, GER, SER**) and submitted by the permit applicant. The SSI identifies the scope of the special inspections services applicable to a construction project, and the **RDPs** and Inspection and Testing Agencies who will provide those services. The SSI is required as a condition for permit issuance in accordance with IBC as amended by VUSBC.

Structural engineer of record (SER). The **RDP** retained by the **Owner** to design or specify structural documents in accordance with the VUSBC and the Code of the County of Fairfax, and whose signature and seal appear on the County-approved structural construction documents.

Structure. See VUSBC-202 **Structure**.

VUSBC-202 **Building.** A combination of any materials, whether portable or fixed, having a roof to form a structure for the use or occupancy by persons or property. The word “building” shall be construed as though followed by the words “or part or parts thereof” unless the context clearly requires a different meaning. For application of this code, each portion of a building which is completely separated from other portions by fire walls complying with Section 705.0 shall be considered as a separate building.

VUSBC-202 **Owner.** The owner or owners of the freehold of the premises or lesser estate therein, a mortgagee or vendee in possession, assignee of rents, receiver, executor, trustee, or lessee in control of a building or structure.

VUSBC-202 **Registered Design Professional (RDP).** An architect or professional engineer, licensed to practice architecture or engineering, as defined under § 54.1-400 et seq. of the Code of Virginia.

VUSBC-202 Structure. An assembly of materials forming a construction for occupancy or use including stadiums, gospel and circus tents, reviewing stands, platforms, stagings, observation towers, radio towers, water tanks, storage tanks (underground and aboveground), trestles, piers, wharves, swimming pools, amusement devices, storage bins, and other structures of this general nature but excluding water wells. The word "structure" shall be construed as though followed by the words "or part or parts thereof" and "or equipment" unless the context clearly requires a different meaning.

IBC-202 Approved. Acceptable to the building official.

IBC-1702.1 Approved agency. An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been approved.

IBC-1702.1 Approved fabricator. An established and qualified person, firm or corporation approved by the building official pursuant to Chapter 17 of this code.

IBC-1702.1 Certificate of compliance. A certificate stating that materials and products meet specified standards or that work was done in compliance with approved construction documents.

IBC-202 Construction documents. Written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of a project necessary for obtaining a building permit.

IBC-1702.1 Fabricated item. Structural, load bearing or lateral load-resisting assemblies consisting of materials assembled prior to installation in a building or structure, or subjected to operations such as heat treatment, thermal cutting, cold working or reforming after manufacture and prior to installation in a building or structure. Materials produced in accordance with standard specifications referenced by this code, such as rolled structural steel shapes, steel-reinforcing bars, masonry units and plywood sheets, shall not be considered "fabricated items."

IBC-1702.1 Inspection certificate. An identification applied on a product by an approved agency containing the name of the manufacturer, the function and performance characteristics, and the name and identification of an approved agency that indicates that the product or material has been inspected and evaluated by an approved agency (see Section 1703.5 and "Label," "Manufacturer's Designation" and "Mark").

IBC-1702.1 Label. An identification applied on a product by the manufacturer that contains the name of the manufacturer, the function and performance characteristics of the product or material, and the name and identification of an approved agency and that indicates that the representative sample of the product or material has been tested and evaluated by an approved agency (see Section 1703.5 and "Inspection Certificate," "Manufacturer's Designation" and "Mark").

IBC-1702.1 Manufacturer's designation. An identification applied on a product by the manufacturer indicating that a product or material complies with a specified standard or set of rules (see also "Inspection Certificate," "Label" and "Mark").

IBC-1702.1 Mark. An identification applied on a product by the manufacturer indicating the name of the manufacturer and the function of a product or material (see also "Inspection Certificate," "Label" and "Manufacturer's Designation").

IBC-1902.1 Reshores. Shores placed snugly under a concrete slab or other structural member after the original forms and shores have been removed from a larger area, thus requiring the new slab or structural member to deflect and support its own weight and existing construction loads applied prior to the installation of the reshores.

IBC-1902.1 Shores. Vertical or inclined support members designed to carry the weight of the formwork, concrete and construction loads above.

IBC-1702.1 Special inspection. Inspection as herein required of the materials, installation, fabrication, erection or placement of components and connections requiring special expertise to ensure compliance with approved construction documents and referenced standards (see Section 1704).

IBC-1702.1 Special inspection, continuous. The full-time observation of work requiring special inspection by an approved special inspector who is present in the area where the work is being performed.

IBC-1702.1 Special inspection, periodic.	The part-time or intermittent observation of work requiring special inspection by an approved special inspector who is present in the area where the work has been or is being performed and at the completion of the work.
IBC-1702.1 Sprayed fire-resistant materials.	Cementitious or fibrous materials that are spray-applied to provide fire-resistant protection of the substrates.
IBC-1702.1 Structural observation.	The visual observation of the structural system by a registered design professional for general conformance to the approved construction documents at significant construction stages and at completion of the structural system. Structural observation does not include or waive the responsibility for the inspection required by Section 109, Section 1704 or other sections of this code.

SIFC-202 ABBREVIATIONS AND PROMULGATING AGENCIES

A2LA	The American Association for Laboratory Accreditation 5301 Buckeystown Pike, Suite 350 Frederick, MD 21704	www.a2la2.net 301-644-3248
ACI	ACI International (American Concrete Institute) P.O. Box 9094 38800 Country Club Drive Farmington Hills, MI 48333 Farmington Hills, MI 48331	www.aci-int.net 248-848-3700
AISC	American Institute of Steel Construction, Inc. One East Wacker Drive, Suite 3100 Chicago, IL 60601-2001	www.aisc.org 312-670-2400
AISC ASD	Manual of Steel Construction – Allowable Stress Design, 9 th Edition	
AISC LRFD	Manual of Steel Construction – Load and Resistance Factor Design, 3 rd Edition	
AISI	American Iron and Steel Institute 1140 Connecticut Avenue, Suite 705 Washington, DC 20036	www.steel.org 202-452-7100
AR	Architect of record	
ASCE	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191-4400	www.asce.org 800-548-2723
ASNT	American Society for Non-Destructive Testing P.O. Box 28515 1711 Arlingate Lane Columbus, OH 43228-0518	www.asnt.org 800-222-2768
ASTM	American Society for Testing and Materials 100 Barr Harbor Drive West Conshohocken, PA 19428-2959	www.astm.org 610-832-9585
AWS	American Welding Society 550 N.W. LeJeune Road Miami, FL 33126	www.aws.org 800-443-9353
BIA	Brick Industry Association 11490 Commerce Park Drive, Suite 300 Reston, VA 20191-1525	www.bia.org 703-620-0010
BPRD	Building Plan Review Division, DPWES	
CASE	Council of American Structural Engineers American Council of Engineering Companies 1015 Fifteenth Street N.W., 8 th Floor Washington, DC 20005-2605	www.acec.org 202-347-7474
CFR	U.S. Code of Federal Regulations	
CID	Commercial Inspections Division, DPWES	www.firstgov.gov 703-324-1910

CCRL	Cement and Concrete Reference Laboratory Building and Fire Research Laboratory National Institute of Standards and Technology 100 Bureau Drive, Stop 8600 Gaithersburg, Maryland 20899-8600	www.bfrl.nist.gov 301-975-5900
CRSI	Concrete Reinforcing Steel Institute 933 North Plum Grove Road Schaumburg, IL 60173-4758	www.crsi.org 847-517-1200
DPWES	Department of Public Works and Environmental Services Herrity Building 12055 Government Center Parkway Fairfax County, VA 22035-5504	www.fairfaxcounty.gov/dpwes
EIFS	Exterior Insulation and Finish Systems	
EFRD	Environmental and Facilities Review Division, DPWES	703-324-1720
FCCSS	Fairfax County Critical Structures Section, DPWES 12055 Government Center Parkway, Suite 316 Fairfax County, VA 22035-5504	703-324-1060 703-324-1064 fax
FRD	Fire and Rescue Department 4100 Chain Bridge Road Fairfax County, VA 22030 Fire Protection Systems Testing Section, Fire Prevention Division Inspections Section, Fire Prevention Division	www.fairfaxcounty.gov/ps/FR 703-246-4821 703-246-4949
GC	General contractor	
GER	Geotechnical engineer of record	
IBC-2000 or IBC	ICC's 2000 International Building Code, with portions of the 2001 and 2002 supplements, as incorporated by VUSBC(2000)	
ICC	International Code Council, Inc. 5203 Leesburg Pike, Suite 600 Falls Church, VA 22041	www.iccsafe.org 703-931-4533
LDS	Land Development Services, DPWES	
NCMA	National Concrete Masonry Association 13750 Sunrise Valley Drive Herndon, VA 20171-4662	www.ncma.org 703-713-1900
NEC	NFPA 70-99 National Electrical Code	
NFPA	National Fire Protection Association 1 Batterymarch Park Quincy, MA 02169-7471	www.nfpa.org 617-770-3000
NICET	National Institute for Certification in Engineering Technologies 1420 King Street Alexandria, VA 22314-2794	www.nicet.org 888-476-3238
NIST	National Institute of Standards and Technology 100 Bureau Drive, Stop 3460 Gaithersburg, MD 20899-3460	www.nist.gov 301-975-8295
Non-RUP	Non-Residential Use Permit	
NVLAP	National Voluntary Laboratory Accreditation Program National Institute of Standards and Technology 100 Bureau Drive, Stop 2140 Gaithersburg, MD 20899-2140	www.nist.gov/nvlap 301-975-4016
OSHA	U.S. Dept. of Labor Occupational Safety & Health Administration 200 Constitution Avenue Washington, DC 20210	www.osha.gov 800-321-6742
PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077	www.portcement.org 847-966-6200

PCI	Precast /Prestressed Concrete Institute 209 West Jackson Boulevard, Suite 500 Chicago, IL 60606	www.pci.org 312-786-0300
PTI	Post-Tensioning Institute 8601 North Black Canyon Highway, Suite 103 Phoenix, AZ 85021	www.post-tension.org 602-870-7540
RCSC	Research Council on Structural Connections c/o American Institute of Steel Construction One East Wacker Drive, Suite 3100 Chicago, IL 60601-2001	www.boltcouncil.org 312-670-2400
RID	Residential Inspections Division, DPWES	703-631-5101
RDP	Registered Design Professional	
SDI	Steel Deck Institute P.O. Box 25 Fox River Grove, IL 60021	www.sdi.org 847-458-4647
SER	Structural engineer of record	
SIER	Special inspections engineer of record	
SIFC-mm.nn	Sections within SIFC-2000 document.	
SIFC-2000	<i>Special Inspections: Implementation in Fairfax County - 2000 Edition</i>	
SJI	Steel Joist Institute 3127 10 th Avenue, North Ext. Myrtle Beach, SC 29577-6760	www.steeljoist.org 843-626-1995
SSI	Statement of Special Inspections	
TMS	The Masonry Society 3970 Broadway, Suite 201-D Boulder, CO 80304-1135	www.masonrysociety.org 303-939-9700
TPI	Truss Plate Institute 583 D'Onofrio Drive, Suite 200 Madison, WI 53719	www.tpinst.org 608-833-5900
UL	Underwriters Laboratories, Inc. 333 Pfingsten Road Northbrook, IL 60062-2096	www.ul.com 1-847-272-8800
VDOT	Virginia Department of Transportation 1221 East Broad Street Richmond, VA 23219	www.virginiadot.org 804-786-2801
VOSHA	Virginia Occupational Safety and Health Administration Department of Labor and Industry 13 South Thirteenth Street Richmond, VA 23219-4101	www.doli.state.va.us 804-371-2327
VUSBC(2000) or VUSBC	Virginia Uniform Statewide Building Code (2000) Edition 13 VAC 5-62-10 et seq., effective October 1, 2003	www.legis.state.va.us
WACEL	WACEL: An Association Of Engineering Laboratories, Inspection Agencies And Building Officials 7900 Wisconsin Avenue, Suite 305 Bethesda, MD 20814	www.wacel.org 301-652-7925

CHAPTER 3 SPECIAL INSPECTIONS CLASSIFICATIONS

SIFC-301 GENERAL

Special inspections of building elements and components may be required by:

- The VUSBC-1704.1 and the IBC Chapter 17; or
- The Code of Virginia § 54.1-402; or
- The building's structural frame design or foundation design by the **SER** and/or **GER**; or
- The soil classification under the building's foundations by the **GER**; or
- The building's seismic design category, wind exposure category or classification as an "essential facility"; or
- The alteration of an existing building's structural frame, foundations, or other items listed above; or
- The Owner.

SIFC-301.1 Required by VUSBC and IBC. The VUSBC requires special inspections for certain building elements and components. A statement of special inspections is required as part of the construction documents. (Note: any buildings not subject to special inspections pursuant to this SIFC-2000, such as single-family homes built on problem soils, may have alternative inspection requirements by DPWES.)

VUSBC-1704.1 General. Where application is made for construction as described in this section, the **Owner** or the **RDP** in responsible charge acting as the owner's agent shall employ one or more special inspectors to provide inspections during construction on the types of work listed under Section 1704. The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for inspection of the particular type of construction or operation requiring special inspection. These inspections are in addition to the inspections specified in Section 115.4.

Exceptions:

1. Special inspections are not required for work of a minor nature or as warranted by conditions in the jurisdiction as approved by the building official.
2. Special inspections are not required for building components unless the design involves the practice of professional engineering or architecture as defined by the laws of this Commonwealth and regulations governing the professional registration and certification of engineers or architects.
3. Unless otherwise required by the building official, special inspections are not required for occupancies in Groups R-3, R-4 or R-5 and occupancies in Group U that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.

VUSBC-1704.1.1 Building permit requirement. The permit applicant shall submit a statement of special inspections prepared by the registered design professional in

responsible charge in accordance with Section 111.5. This statement shall include a complete list of materials and work requiring special inspections by this section, the inspections to be performed and a list of the individuals, approved agencies or firms intended to be retained for conducting such inspections.

SIFC-301.2 Required by Code of Virginia. See SIFC-303 for the Code of Virginia § 54.1-402 requirements for **RDPs** to sign and seal design drawings for buildings, depending upon Group (type of use and occupant load), building height and area (stories and size), and size of electrical, plumbing and mechanical services. Special inspections are required for elements and components of such buildings.

SIFC-301.3 Seismic and wind.

SIFC-301.3.1 Seismic resistance. "Essential facilities" buildings require special inspections for elements and components. In Fairfax County, buildings are Seismic Design Category B or C (see IBC-1616.3 *Determination of seismic design category*, and IBC-1604.5 *Importance factors*). Such "Essential facilities" buildings of Seismic Design Category C, D, E or F require a quality assurance plan and special inspections for elements and components (see IBC-1705, IBC-1707 and IBC-1708).

SIFC-301.3.2 Wind. The basic wind speed in Fairfax County is less than 110 mph, and therefore special inspections are not required for wind resistance (IBC-1706.1).

SIFC-301.4 Building and foundation elements. The requirements of this SIFC-2000 shall apply to building elements and components, foundation elements or element fabrication procedures that are subject to special inspections as required by the VUSBC and IBC or as specified by the **SER** and/or **GER** designs. Such elements or procedures, including elements of "unique design", are identified in SIFC-302.

SIFC-301.5 Existing buildings and structures. Modifications to the primary structural system of existing buildings or structures, whose elements fall within the special inspections classification criteria, shall be subject to special inspections.

SIFC-301.6 Elective by Owner. **Owners** of buildings may elect to follow the Special Inspections Program on projects that otherwise do not fall under the above criteria. In such cases, the **Owner** shall notify the **BPRD** of this intent prior to issuance of the building permit. **Owners** electing to follow the Special Inspections Program shall follow all applicable requirements of this SIFC-2000.

SIFC-302 SPECIAL INSPECTIONS REQUIRED

The following shall be subject to special inspections:

SIFC-302.1 Fabricators.

For fabricated items requiring special inspection, the **SIER** shall conduct special inspection of the fabricator's shop facilities.

IBC-1704.2 Inspection of fabricators. Where fabrication of structural load-bearing members and assemblies is being performed on the premises of a fabricator's shop, special inspection of the fabricated items shall be required by this section and as required elsewhere in this code.

IBC-1704.2.1 Fabrication and implementation procedures. The special inspector shall verify that the fabricator maintains detailed fabrication and quality control procedures that provide a basis for inspection control of the workmanship and the fabricator's ability to conform to approved construction documents and referenced standards. The special inspector shall review the procedures for completeness and adequacy relative to the code requirements for the fabricator's scope of work.

Exception: Special inspections as required by Section 1704.2 shall not be required where the fabricator is approved in accordance with Section 1704.2.2.

IBC-1704.2.2 Fabricator approval. Special inspections required by this code are not required where the work is done on the premises of a fabricator registered and approved to perform such work without special inspection. Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by an approved special inspection agency. At completion of fabrication, the approved fabricator shall submit a certificate of compliance to the building official stating that the work was performed in accordance with the approved construction documents.

SIFC-302.2 Structural steel (See SIFC-2000 Chapter 6).

a. Steel fabricators. Special inspections of the fabrication process are required, for all steel fabricated assemblies that are themselves subject to special inspections, except as exempted in IBC-1704.3.

IBC-1704.3 Exceptions:

1. Special inspection of the steel fabrication process shall not be required where the fabricator does not perform any welding, thermal cutting or heating operation of any kind as part of the fabrication process. In such cases, the fabricator shall be required to submit a detailed procedure for material control that demonstrates the fabricator's ability to maintain suitable records and procedures such that, at any time during the fabrication process, the material specification, grade and mill test reports for the main stress-carrying elements are capable of being determined.

2. The special inspector need not be continuously present during welding of the following items, provided the materials, welding procedures and qualifications of welders are verified prior to the start of the work; periodic inspections are made of the work in progress; and a visual inspection of all welds is made prior to completion or prior to shipment of shop welding.

- 2.1. Single pass fillet welds not exceeding $\frac{5}{16}$ inch (7.9 mm) in size.
- 2.2. Floor and roof deck welding.
- 2.3. Welded studs when used for structural diaphragm.
- 2.4. Welded sheet steel for cold-formed steel framing members such as studs and joists.
- 2.5. Welding of stairs and railing systems.

b. Buildings of any height. The following steel elements of buildings, regardless of height:

- Rigid or semi-rigid connections, field welded or bolted.
- Bolted connections with a requirement for a minimum pretension beyond snug tight to be achieved.
- Steel beam or column elements with clear spans greater than 50 feet in length or height.

- Steel trusses, open-webbed joist girders or steel joists (other than those manufactured to SJI specifications).
- Plate girders of any span.
- Space frames with clear spans greater than 35 feet.
- Steel floor and/or roof decks designed to act as diaphragms to distribute lateral forces to wind resisting frames.
- Cable supported structures, except tents.
- Bolted or welded lateral bracing elements.
- Seismic-force-resisting-systems (Seismic Design Category C, D, E, or F).

c. Buildings more than three stories in height. In addition to the steel elements of SIFC-302.1.b, the following steel elements of buildings greater than three (3) stories in height:

- Open-webbed joist girders and steel joists (including those manufactured to SJI specifications).
- Steel stairs and ladders connecting more than three stories.
- Steel floor and/or roof decks.
- Field-welded shear studs.

d. Seismic-force-resisting systems. (Seismic Design Category C, D, E or F):

- Welding of structural elements as required by IBC-1707.2 and IBC-1708.4.
- Cold-formed steel framing as required by IBC-1707.4.

SIFC-302.3 Cast-in-place concrete (See SIFC-2000 Chapter 7).

a. Components. All structural elements of cast-in-place concrete, including reinforced, prestressed, or post-tensioned concrete elements, and concrete topping on stay-in-place steel decking, both composite and non-composite, except as exempted by IBC-1704.4 Exception. To qualify for the exception, the construction shall be on undisturbed, stable, non-problem soil or rock, or as specified by the **SER** or **GER**, as appropriate. See also SIFC-302.6 and SIFC-302.7 for foundations and walls.

IBC-1704.4 Exception: Special inspections shall not be required for:

1. Isolated spread concrete footings of buildings three stories or less in height that are fully supported on earth or rock.
2. Continuous concrete footings supporting walls of buildings three stories or less in height that are fully supported on earth or rock where:
 - 2.1. The footings support walls of light frame construction;
 - 2.2. The footings are designed in accordance with Table 1805.4.2; or
 - 2.3. The structural design is based on a f'_c no greater than 2,500 pounds per square inch (17.2 MPa).
3. Nonstructural concrete slabs supported directly on the ground, including prestressed slabs on grade, where the effective prestress in the concrete is less than 150 pounds per square inch (1.03 MPa).
4. Concrete foundation walls constructed in accordance with Table 1805.5(1), 1805.5(2), 1805.5(3) or 1805.5(4).
5. Concrete patios, driveways and sidewalks, on grade.

b. Seismic-force-resisting systems. (Seismic Design Category C, D, E, or F): Testing of reinforcing steel and prestressing steel as required by IBC-1708.3.

SIFC-302.4 Precast concrete (See SIFC-2000 Chapter 8).

a. Precast concrete fabricators. Special inspections of the fabrication process are required, for all precast concrete elements that are themselves subject to special inspections.

b. Off-site precast components. All architectural and/or structural precast concrete building elements manufactured off-site, usually at a precast concrete plant, with the exception of miscellaneous cast stone items such as sills, coping, pavers, etc., or as otherwise approved.

c. Site-cast precast components. All site-cast, precast concrete elements, including tilt-up concrete wall panels.

d. Seismic-force-resisting systems. (Seismic Design Category C, D, E, or F): Welding of connections as required by IBC-1707.2.

SIFC-302.5 Masonry (See SIFC-2000 Chapter 10).

a. Elements. Masonry elements, depending on the masonry design, classification of the building or type of occupancy (see IBC-Table 1604.5 and IBC-Table 1617.6).

IBC-1704.5 Exception: Special inspections shall not be required for:

1. Empirically designed masonry, glass unit masonry, or masonry veneer designed by Section 2109, 2110, or ACI 530/ASCE 5/TMS 402 Chapters 5, 6 or 7 when they are part of nonessential buildings (see Tables 1604.5 and 1617.6).
2. Masonry foundation walls constructed in accordance with Table 1805.5(1), 1805.5(2), 1805.5(3) or 1805.5(4).

b. Seismic-force-resisting systems. (Seismic Design Category C, D, E, or F) as required by IBC-1708.1.

SIFC-302.6 Wood (See SIFC-2000 Chapter 9).

a. Wood fabricators. Special inspections of the fabrication process are required.

b. Seismic-force-resisting systems. (Seismic Design Category C, D, E or F): as required by IBC-1707.3.

SIFC-302.7 Soils and foundations (See SIFC-2000 Chapter 11).

a. Shallow footings and foundations. Soils and building foundation elements when either of the following conditions exist:

- Problem Soils. The building footprint is located in a problem soils area, as defined by the Fairfax County Public Facilities Manual and/or as indicated by the County-approved geotechnical report; or
- Structural Fill. The bearing material under the building footprint consists of compacted structural fill.

IBC-1704.7 Exception: Special inspections not required during placement of fill less than 12 inches (305 mm) deep.

b. Deep foundations. Building foundation elements for the following systems:

- Pile foundations of all buildings.
- Pier foundations of all buildings, assigned to Seismic Design Category C, D, E or F. The Statement of Special Inspections shall specifically include the special inspections

required for the seismic-resisting elements.

- c. Bearing material.** Bearing material when the building's foundations are designed for a required bearing capacity of greater than 3,000 pounds per square foot.

SIFC-302.8 Earth retention systems (See SIFC-2000 Chapter 12).

All earth retention systems retaining 10 feet or more of unbalanced fill, and/or trenching operations deeper than 8 feet, whether permanent or temporary, including, but not limited to:

- Building foundation walls.
- Retaining walls.
- Soldier piles and lagging.
- Soil nailing systems.
- Sheet piling.
- Braced or shored walls.
- Tied-back walls.
- Slurry walls.

SIFC-302.9 Exterior Insulation and Finish Systems (EIFS) (See SIFC-2000 Chapter 14).

All EIFS applications, except those installed over a water-resistive barrier with a means of draining moisture to the exterior, or those installed over masonry or concrete walls. (Note: any EIFS elements not subject to special inspections pursuant to this SIFC-2000 are instead subject to alternative product approval and certification requirements by DPWES.)

SIFC-302.10 Sprayed fire-resistant materials. (See SIFC-2000 Chapter 15.)

All sprayed fire-resistant materials applications.

SIFC-302.11 Smoke control. (See SIFC-2000 Chapter 16.)

All smoke control systems.

SIFC-302.12 Mechanical, electrical and plumbing components. (See SIFC-2000 Chapter 17.)

(Seismic Design Category C, D, E or F): as required by IBC-1707.7 (see IBC-1621).

SIFC-302.13 Special cases.

Components of "unique" design or construction characteristics, or unusual materials, or with special installation requirements, may be subject to special inspections (see IBC-1704.13 and Code of Virginia § 54.1-402). **BPRD** and **FCCSS** will review such items on a case by case basis.

**SIFC-303 CODE OF VIRGINIA § 54.1-402
ARCHITECTS AND PROFESSIONAL ENGINEERS RELATED LAWS**

The Code of Virginia requires that buildings which meet the specific criteria in § 54.1-402 are to be designed by RDPs, with signed and sealed drawings, as listed in the following charts. Special inspections are then required for building elements and components of those buildings, as listed in SIFC- 302.

§ 54.1-402 CHART A - GENERAL DESIGN

A proposed structure which is classified within any of the categories marked "Yes" requires an Architect/Engineer (A/E) seal on the plans.

Group	Description	Area			Stories	
		5,000 ft ² (465 m ²) and under	5,001 ft ² - 15,000 ft ² (466 m ² -1,390 m ²)	Over 15,000 ft ² (1,390 m ²)	3 or less	Over 3
A*	Assembly	Yes	Yes	Yes	Yes	Yes
B	Business	—	Yes	Yes		Yes
E	Educational (schools & day care centers)	Yes	Yes	Yes	Yes	Yes
F	Factory & Industry	—	—	Yes	—	Yes
H	High Hazard	Yes	Yes	Yes	Yes	Yes
I	Institutional	Yes	Yes	Yes	Yes	Yes
M	Mercantile	—	Yes	Yes	—	Yes
R-1	Hotel, Motel, Dormitory	Yes	Yes	Yes	Yes	Yes
R-2	Multi-Family Residential	—	—	—	—	Yes
R-3	1& 2 Family Attached	—	—	—	—	Yes
R-4, R-5	1& 2 Family Detached	—	—	—	—	Yes
S	Storage (Farm)	—	—	—	—	—
	Storage (Non-Farm)	—	—	Yes	—	Yes
U	Utility & Miscellaneous	—	—	—	—	—

* Assembly (churches, A-4) are exempt if building does not exceed 5,000 ft² (465 m²) or three stories, and the occupant load does not exceed 100.

Notes:

- A local building official may require an A/E seal even if not required to do so by this chart.
- The law requires that, where an A/E seal is not present, the plans must be signed by the individual (not company) responsible for the design, including his/her occupation and address.
- The above chart applies to new construction and to additions or remodeling which involve a change in occupancy (i.e., group), occupancy load (i.e., increase in allowable occupancy), modification of the structural system, change in access or exit, or increase in fire hazard. Additions or remodeling which do not involve any of these factors may not require an A/E seal under § 54.1 of the Code of Virginia, although Notes a and b still apply.
- Any unique design of structural elements of floors, walls, roofs, or foundations requires an A/E seal, regardless of whether or not the remainder of the plans require such certification.
- Buildings, structures, or electrical and mechanical installations which are not otherwise exempted but which are of standard design, provided they bear the certification of a professional engineer or architect registered or licensed in another state, and provided that the design is adapted for the specific location and conformity with local codes, ordinances and regulations, and is so certified by a professional engineer or architect licensed in Virginia may not require an A/E seal.

§ 54.1-402 CHART B - ELECTRICAL DESIGN

A proposed electrical system which is classified within any of the categories marked "Yes" requires an A/E seal on the plans. Those not marked "Yes" may not require an A/E seal only if designed by a licensed master electrician or Class A electrical contractor (see Notes b and d).

Group	Description	Buildings in Which Located				Electrical Systems			
		Stories		Occupant Load		Voltage		Amperage	
		3 or less	Over 3	100 or less	Over 100	600 or less	Over 600	800 or less	Over 800
A-1	Theaters	—	Yes	—	Yes	—	Yes	—	Yes
A-2	Restaurants, etc.	—	Yes	—	—	—	Yes	—	Yes
A-3	Dance Halls	—	Yes	—	—	—	Yes	—	Yes
A-3	Churches ONLY	—	Yes	—	—	Yes	Yes	—	Yes
A-4	Indoor Arenas, etc.	—	Yes	—	—	—	Yes	—	Yes
A-5	Grandstands, etc.	—	Yes	—	—	—	Yes	—	Yes
B	Business	—	Yes	—	—	—	Yes	—	Yes
E	School & Day Care Centers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F	Factory & Industry	—	Yes	—	—	—	Yes	—	—
H	High Hazard	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
I	Institutional, general	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
I	Day Nurseries & Clinics without life support systems	—	Yes	—	—	—	Yes	—	Yes
M	Mercantile	—	Yes	—	—	—	Yes	—	Yes
R	Residential	—	Yes	—	—	—	Yes	—	Yes
S	Storage (Farm)	—	—	—	—	—	—	—	—
	Storage (Non-Farm)	—	Yes	—	—	—	Yes	—	Yes
U	Utility & Miscellaneous	—	Yes	—	—	—	Yes	—	Yes

Notes:

- A local building official may require an A/E seal for electrical work even if not required to do so by this chart.
- The law requires that, where an A/E seal is not present, the plans must be signed by the individual (not company) responsible for the design, including his/her occupation and address.
- The above chart applies both to new construction and to additions or remodeling.
- The exemption for electrical contractors and electricians is applicable only when both design and installation are under his/her direction or control.

§ 54.1-402 CHART C - PLUMBING & MECHANICAL DESIGN

A proposed plumbing or mechanical system which is classified within any of the categories marked "Yes" requires an A/E seal on the plans. Those not marked "Yes" may not require an A/E seal only if designed by a person licensed as a master plumber, master mechanical worker, or Class A contractor in those specialties by written examination (see Notes c and e).

Group	Description	Buildings in Which Located				Plumbing & Mechanical Systems (see Note a)	
		Stories		Occupant Load		Below Threshold Level	Above Threshold Level
		3 or less	Over 3	100 or less	Over 100		
A-1	Theaters	—	Yes	—	Yes	—	Yes
A-2	Restaurants, etc.	—	Yes	—	—	—	Yes
A-3	Dance Halls	—	Yes	—	—	—	Yes
A-3	Churches ONLY	—	Yes	—	—	Yes	Yes
A-4	Indoor Arenas, etc.	—	Yes	—	—	—	Yes
A-5	Grandstands, etc.	—	Yes	—	—	—	Yes
B	Business	—	Yes	—	—	—	Yes
E	School & Day Care Centers	Yes	Yes	Yes	Yes	Yes	Yes
F	Factory & Industry	—	Yes	—	—	—	Yes
H	High Hazard	Yes	Yes	Yes	Yes	Yes	Yes
I	Institutional, general	Yes	Yes	Yes	Yes	Yes	Yes
I	Day Nurseries & Clinics without life support systems	—	Yes	—	—	—	Yes
M	Mercantile	—	Yes	—	—	—	Yes
R	Residential	—	Yes	—	—	—	Yes
S	Storage (Farm)	—	—	—	—	—	—
	Storage (Non-Farm)	—	Yes	—	—	—	Yes
U	Miscellaneous	—	Yes	—	—	—	Yes

Notes:

- The "Threshold Level" is defined in the law as "Plumbing and mechanical systems using packaged mechanical equipment, such as equipment of cataloged standard design which has been coordinated and tested by the manufacturer, which comply with all applicable codes. These mechanical systems shall not exceed gauge pressures of 125 psi/860 kPa, other than refrigeration, or temperatures other than flue gas of 300°F/150°C...."
- A local building official may require an A/E seal for plumbing and mechanical systems even if not required to do so by this chart.
- The law requires that, where an A/E seal is not present, the plans must be signed by the individual (not company) responsible for the design, including his/her occupation and address.
- The above chart applies to both new construction and to additions or remodeling.
- The exemptions for plumbers, HVAC workers, and mechanical contractors are applicable only when both design and installation are under his/her direction or control.

SIFC-304 STATEMENT OF SPECIAL INSPECTIONS (SSI)

SIFC-304.1 Content. The SSI shall identify the scope of the special inspections services applicable to the project and shall include the names of the **RDPs**, including the **SIER** and **GER**, and the inspection and testing agencies providing those services. The **SIER** and the inspection and testing agencies are subject to **FCCSS** approval on behalf of the building official.

SIFC-304.2 Submittal, review and approval. The SSI shall be incorporated into the construction documents (see SIFC-301.1 and VUSBC-1704.1.1) and shall be submitted by the permit applicant to the **BPRD**. The **BPRD** shall review and approve the SSI prior to scheduling the **FCCSS** preconstruction meeting (see Chapter 4). **FCCSS** shall also review and approve the SSI during the **FCCSS** preconstruction meeting. Both County approvals are required prior to issuance of a building permit.

For projects with multiple buildings, a listing of the special inspections project buildings with street addresses, plan Q-number(s) and building permit numbers shall be attached to the SSI. The listing can be used by the **SIER** or **GER** during conduct of special inspections on a given day by suitably annotating the listing to identify the particular building then attaching it to the inspection report.

SIFC-304.3 SSI Form. A blank SSI Form is provided on the following four pages. Page one of the form, to be prepared by the **Owner**, identifies the project and the **RDPs** of record for the project. Pages two and three of the form, to be prepared by the appropriate **RDPs** of record (**AR, GER, SER**), specify the scope of special inspections services; blank spaces are also provided for entry of completion dates as special inspection services are performed. Page four of the form is a final report of special inspections, to be prepared by the **SIER**, for use after all special inspections services are completed.

**FAIRFAX COUNTY, VIRGINIA
SPECIAL INSPECTIONS PROGRAM
Statement of Special Inspections**

Q-Number: _____ **Permit Number:** _____

PROJECT: _____ **VUSBC Edition:** _____

Address: _____ **Group:** _____

_____ **Construction Type:** _____

Building Owner: _____
Name *Company*

Owner's Address: _____

Architect of Record: _____
Name & License *Company*

Structural Engineer of Record: _____
Name & License *Company*

Geotechnical Engineer of Record: _____
Name & License *Company*

Special Inspections Engineer of Record: _____
Name & License *Company*

General Contractor: _____
Name & License *Company*

This Statement of Special Inspections is submitted as a condition for permit issuance in accordance with the Virginia Uniform Statewide Building Code. It includes a schedule of special inspections applicable to this project.

The Special Inspections Engineer of Record shall keep records of specified special inspections and testing and shall furnish copies of inspection and testing reports to the Fairfax County Critical Structures Section and to the appropriate registered design professionals of record. Discrepancies from the approved plans and specifications and code violations observed during the conduct of special inspections services shall be brought to the immediate attention of the contractor for correction, to the attention of the Fairfax County Critical Structures Section, and to the appropriate registered design professionals of record. A final report of special inspections documenting completion of specified special inspections and correction of any discrepancies and observed code violations noted in the inspection and testing reports shall be submitted to and approved by the Fairfax County Critical Structures Section prior to the final building inspection approval by County staff.

Prepared by:

(Type or print) Name *Signature & Date*

Reviewed by Registered Design Professional of Record: _____
Signature & Date

Building Owner's Authorization: _____
Signature & Date

Building Official's Acceptance: _____
Signature & Date

Building Plan Review Division *Signature & Date*

Critical Structures Section *Signature & Date*

Page 2 Of 4 PROJECT:		SCHEDULE OF FAIRFAX COUNTY SPECIAL INSPECTIONS		Date: Prepared By:	
ACTIVITY	Y/N	SCOPE OF SERVICE	AGENT *	DATE COMPLETED	
STEEL CONSTRUCTION					
Inspection of Steel Fabricators					
Material Receiving					
Erection					
a. Installation of HS Bolts					
b. Welding					
c. Details					
CONCRETE CONSTRUCTION					
Materials					
Installation of Reinforcing and Prestressing Steel					
Formwork					
Concreting Operations					
Inspection During Prestressing					
Manufacture of Precast Concrete					
Erection of Precast Concrete					

Page 3 Of 4 PROJECT:		SCHEDULE OF FAIRFAX COUNTY SPECIAL INSPECTIONS		Date: Prepared By:	
ACTIVITY	Y/N	SCOPE OF SERVICE	AGENT *	DATE COMPLETED	
MASONRY CONSTRUCTION					
WOOD CONSTRUCTION					
PREPARED FILL					
Site Preparation					
During Fill Placement					
Evaluation of In-Place Density					
PILE FOUNDATIONS					
PIER FOUNDATIONS					
EXTERIOR INSULATION AND FINISH SYSTEMS					
SPRAYED FIRE-RESISTANT MATERIALS					
SMOKE CONTROL SYSTEMS					
MECHANICAL, ELECTRICAL AND PLUMBING COMPONENTS					
OTHER					

* INSPECTION AGENTS

1. Special Inspections Engineer of Record: _____

2. Inspection and Testing Agency: _____

3. Inspection and Testing Agency: _____

**FAIRFAX COUNTY, VIRGINIA
SPECIAL INSPECTIONS PROGRAM
Final Report of Special Inspections**

Q-Number: _____ **Permit Number:** _____

PROJECT: _____

Address: _____

Special Inspections Engineer of Record: _____

Inspection reports numbered _____ to _____, and test reports numbered _____ to _____, all submitted prior to this final report, form a basis for, and are to be considered an integral part of, this final report.

The special inspections specified for this project and itemized in the County-approved Statement of Special Inspections have been completed pursuant to the Fairfax County Special Inspection Program requirements. The building elements subject to special inspections have been found to be in compliance with County-approved documents and in conformance with project specifications. Violations of the Virginia Uniform Statewide Building Code observed in the conduct of special inspections services were brought to the attention of the appropriate registered design professional of record, the County, and the owner for resolution and the resolution was approved by the County.

Submitted by Special Inspections Engineer of Record:

Signature & Date

(Type or print) Name

Special Inspections
Engineer of Record
P.E. Seal

Reviewed by Registered Design Professional of Record:

Signature & Date

(Type or print) Name

Accepted by Building Official:

Signature & Date Critical Structures Section

(Type or print) Name

CHAPTER 4 FCCSS PRECONSTRUCTION MEETING

SIFC-401 WHEN REQUIRED

A preconstruction meeting with **FCCSS** is required for every project that will be constructed under the Special Inspections Program, to review the special inspections requirements of the construction project. The **FCCSS** preconstruction meeting shall take place after structural review and approval of construction documents is completed by the **BPRD**, and prior to the issuance of a building permit. The following shall be discussed:

- **Construction Project Requirements.** Construction project requirements of the Fairfax County Special Inspections Program, including construction methods, site safety and fire hazard prevention during the construction process.
- **Statement of Special Inspections (SSI).** The scope of special inspections for the project, including required and elective special inspections (see Chapter 3).
- **Responsibilities.** The roles and responsibilities of each party.
- **Communication.** Communication channels between the County's and the **Owner's** representatives.
- **Phased Construction.** Requirements for phasing or separation of permits, certificates of completion and occupancy requirements.

SIFC-402 PARTICIPANTS

The following members of the construction team shall participate in **FCCSS** preconstruction meetings:

- **Owner** (required for all projects)
- **Architect of record** (required for precast concrete building elements; optional for other building / foundation elements and/or soils / foundation elements)
- **Structural engineer of record** (required for building / foundation elements)
- **Geotechnical engineer of record** (required for soils / foundation elements)
- **General contractor** (required for all projects)
- **Special inspections engineer of record** (required for all projects)
- **Fairfax County Critical Structures staff** (required for all projects)
- **Other parties** as deemed appropriate by the **Owner** or **FCCSS** (inspection and testing agencies, subcontractors, etc.)

SIFC-403 PROCEDURAL REQUIREMENTS

SIFC-403.1 Scheduling of meeting. The **Owner** shall identify the necessary participants and schedule the meeting by calling **FCCSS** at 703-324-1060. Required participants shall be represented during the preconstruction meeting. The **Owner** shall bring to the preconstruction meeting a copy of the County-approved construction documents including the **BPRD**-approved Statement of Special Inspections. At the preconstruction meeting, the **Owner** shall complete a contact sheet with names, addresses, and telephone numbers of those in attendance.

SIFC-403.2 Location of meeting. Fairfax County Critical Structures Section, Herrity Building, 3rd Floor-Suite 316, 12055 Government Center Parkway, Fairfax, Virginia 22035-5504.

SIFC-403.3 Use of SIFC-2000. The SIFC-2000 will be used in the meeting to review, discuss, clarify and approve elements of the Special Inspections Program that apply to the project. It is recommended that, prior to the meeting, all parties review this SIFC-2000 as it pertains to the specific project.

SIFC-403.4 FCCSS approval of Statement of Special Inspections. FCCSS shall review and approve the Statement of Special Inspections (see SIFC-304) during the meeting. After FCCSS review and approval of the SSI, and completion of BPRD review and approval of the construction documents, a building permit can be issued.

CHAPTER 5 SPECIAL INSPECTIONS AND TESTING SERVICES

SIFC-501 PROCEDURAL REQUIREMENTS

SIFC-501.1 General. The **Owner** shall be responsible for retaining an independent **Special inspections engineer of record (SIER)** and an **inspection and testing agency** to provide special inspections, materials testing, and related services, including inspection and testing agency supervision, as described in the County-approved Statement of Special Inspections and this SIFC-2000. Under no circumstances shall the **GC** or any of the subcontractors be permitted to provide special inspections and testing services.

The **SIER** shall be an **RDP** retained by the **Owner**, independent of the contractors performing the work subject to special inspections, and approved by **FCCSS** to perform special inspections. The **SIER** is responsible for the work of the inspection and testing agency. The **inspection and testing agency** shall be an established and recognized agency or agencies, retained by the **Owner**, independent of the contractors performing the work subject to special inspections, and approved by **FCCSS** to perform special inspections and materials testing required by the VUSBC, IBC and this SIFC-2000. To be approved by **FCCSS**, an inspection and testing agency shall meet the requirements of ASTM E 329 and shall be accredited.

The **GC** shall coordinate the scheduling of inspections. The inspection and testing agency personnel required on-site shall be in numbers sufficient to perform all required tasks.

SIFC-501.2 Review and approval. As part of the SSI submitted for County approval and permit issuance, the **Owner** shall furnish the County with the names of the **SIER** and the inspection and testing agency retained to provide special inspections and testing services. The SSI is reviewed and approved by the **BPRD** and **FCCSS** (see SIFC-304.2 and SIFC-404.4).

After County review and approval of the SSI, the **SIER** shall submit to **FCCSS** one copy of resumes of all inspection and testing agency personnel assigned to the project, inspectors' certifications and accreditation certificates for laboratory facilities. The personnel and laboratories shall meet the requirements of SIFC-503 and SIFC-504 for **FCCSS** approval.

SIFC-501.3 Changes in construction team. In the event that the **AR, SER, GER, GC, SIER**, or the organizations or individuals contracted for special inspections or testing services are changed during the course of the work, the **Owner** shall notify **FCCSS** immediately. The **Owner** shall provide a written explanation for such change; shall identify and obtain County approval for the replacement organization or a replacement individual; and shall schedule a new meeting with **FCCSS** and the replacement organization or the replacement individual. The **Owner** shall ensure that there is a timely transfer of information and responsibility to the replacement party.

Change of **AR** or **SER** requires approval by **BPRD**. Change of **GER** requires approval by **EFRD** and by **FCCSS**. Change of **GC** requires notification to **BPRD** and **FCCSS**, and if the **GC** is named on the building permit, then a new building permit is required. Change of **SIER** requires approval by **FCCSS**. In the event the inspection and testing agency has significant changes in management, ownership, personnel certifications or laboratory accreditation, re-approval by **FCCSS** is required.

SIFC-502 ROLES AND RESPONSIBILITIES

SIFC-502.1 Special inspections. The **SIER** shall provide and certify special inspections of building components and testing of construction materials where such inspections and testing are required by the VUSBC, IBC, the SSI and this SIFC-2000.

SIFC-502.2 Approved documents. Prior to conducting special inspections and materials testing, the **SIER** shall be responsible for verification of the following:

- **Building permit.** A building permit for the particular construction has been issued and a copy of the building permit is available at the job site.
- **Approved construction documents.** A set of original County-approved construction documents is available at the job site.
- **Approved fabrication and erection documents.** County-approved fabrication and erection documents, which also bear the **SER** review/approval stamp, are available at the job site. Other approved fabrication and erection documents which do not require County approval but which bear the **SER** review/approval stamp are available at the job site and a record copy of such documents received by **FCCSS** where required by this SIFC-2000.
- **Document revisions.** All revisions to County-approved construction documents, or other fabrication and erection documents, such as field change orders in response to requests for information, are in writing and have been approved, signed and sealed by the **AR**, **SER** and/or **GER**, and the County, as appropriate. If such revisions do not bear the County stamp of approval, the **SIER** shall confirm with **FCCSS** whether the revisions are authorized or whether formal re-approval of revised documents by **BPRD**, **EFRD** or **FCCSS** is required. It shall be the responsibility of the **AR**, **SER**, and/or **GER**, as appropriate, to submit written revisions to **FCCSS** within seven working days of approval.

SIFC-502.3 Deviations. The **SIER** and the **SIER's** representatives/field technicians shall not suggest, direct or authorize the fabricator, erector or contractor to deviate from the contract documents, County-approved construction documents, or County-approved fabrication and erection documents, without the express written approval of the **AR**, **SER**, **GER** and **FCCSS**, as appropriate.

SIFC-502.4 Special inspection reports. The **SIER** shall report the results of testing and inspections, both approvals and rejections, to **FCCSS** according to the following procedures:

- **Seal and signature.** Each report shall bear a signature and seal of the **SIER** and shall include the correct building permit number and project address. Reports without project identification shall be rejected.
- **Submissions.** Both approval and rejection reports shall always be submitted to **FCCSS**, the **Owner**, and the **GC**, and shall be submitted to the **AR**, **SER**, and/or **GER** as appropriate. Deficiencies shall be reported to the **GC** for correction. With the exception of situations where a code violation or safety hazard is discovered (see SIFC-502.5 and SIFC-502.6), all inspection and test reports shall be submitted to **FCCSS** within seven working days of the inspection or test performed.
- **Compliance.** Unless deficiencies are discovered or code violations are revealed during the conduct of special inspection and testing services, special inspection and testing reports shall indicate that the specified work has been inspected and found to be in compliance with County-approved documents.

- **Deficiencies.** Deficiency reports shall contain the details describing the nature and specific location of the deficiency and include a description of the action recommended by the **AR**, **SER** and/or **GER**, as appropriate, to correct it.
- **Correction of deficiencies.** At the completion of a project, all recorded problems or deficiencies shall be documented as having been corrected and approved by the **AR**, **SER** and/or **GER**, as appropriate.
- **Completion letters.** Upon completion of special inspections and testing for a particular construction discipline, such as “structural steel”, the **SIER** shall, after review and approval by the appropriate **RDPs**, submit a completion letter to **FCCSS**.
- **Final report of special inspections.** Upon completion of all special inspections and testing for the scope of special inspections applicable to the construction project, the **SIER** shall, after review and approval by the appropriate **RDPs**, submit a final report of special inspections to **FCCSS** for review and approval. **FCCSS** approval is required prior to final building inspection approval.

SIFC-502.5 Code violations. In the event that the **SIER** and/or **SIER** personnel observe a condition during the conduct of special inspection and/or testing services that constitutes a violation of the VUSBC or the Code of the County of Fairfax, the **SIER** shall immediately notify the appropriate **RDPs** of record and **FCCSS** for resolution, followed with a written report submitted to **FCCSS** within seven working days.

SIFC-502.6 Job site safety violations. In the event that the **SIER** and/or **SIER** personnel observe a condition that poses an immediate or serious safety hazard to job site workers and/or the general public, the **SIER** shall immediately notify the **GC** superintendent and **FCCSS** for resolution.

SIFC-503 PERSONNEL QUALIFICATIONS

SIFC-503.1 Direct supervision. The inspection and testing agency personnel assigned to conduct special inspections in Fairfax County shall work under the supervision of an approved **RDP** with demonstrated proficiency in the construction discipline to be evaluated.

SIFC-503.2 Certification. Except for individuals who are **RDPs**, inspection and testing agency field inspection personnel shall be certified by examination through WACEL, ACI, AWS, ASNT, NICET or other organizations whose programs are recognized by the County. Inspection and testing agency personnel shall be reviewed and approved by **FCCSS** on a case by case basis. The inspection and testing agency personnel shall perform only those services in which they have demonstrated competency through an approved certification or registration program. Different levels or types of special inspections require different levels or types of expertise by the inspector, and the two shall match. Tests or inspections performed by unqualified or non-approved inspection and testing agency personnel shall be automatically rejected, and work shall not proceed until reinspections are performed and approved.

SIFC-503.3 Unusual functions. In the event there is no certification program applicable to a specific function, the **SIER** shall submit a signed statement attesting to the competency of inspection and testing agency personnel and identifying the basis upon which such statement is made.

SIFC-504 LABORATORY ACCEPTANCE STANDARDS

All laboratory facilities performing special inspection and testing services in the County shall meet the requirements of ASTM E 329, ASTM D 3740, and ASTM C 1077 as applicable and shall be individually accredited by organizations such as WACEL, A2LA, NIST, NVLAP or other organizations whose programs are recognized by the County. Where inspection and testing agencies have multiple offices and laboratory facilities performing special inspection and testing services in the County, each laboratory shall be individually accredited and meet the requirements of ASTM E 329, ASTM D 3740, and ASTM C 1077 as applicable. Laboratories shall be reviewed and approved by **FCCSS** on a case by case basis and shall perform only those tests and analyses for which accreditation has been obtained. The **SIER** shall approve on-site laboratories provided the on-site laboratory demonstrates that it follows a quality systems manual, equipment calibration program and technician certification program of an accredited laboratory.

CHAPTER 6 STRUCTURAL STEEL

SIFC-601 GENERAL

SIFC-601.1 Scope. The requirements of this chapter and IBC-1704.3 shall apply when construction includes structural hot-rolled steel building elements as listed in SIFC-302.2. Where required, structural hot-rolled steel building elements shall also comply with IBC-1705, IBC-1707 and IBC-1708. See SIFC-2000 Chapter 14 for sprayed fire-resistant materials.

SIFC-601.2 Steel fabrication. Structural steel fabricators shall be subject to special inspections as required by SIFC-302.1 and SIFC-603 and IBC-1704.2.

SIFC-601.3 Steel erection. Structural steel elements shall be subject to special inspections as required by SIFC-604. Construction shall conform to the AISC Code of Standard Practice. Adequate guying and/or bracing shall be used during the erection process to maintain the stability of the structure. Structural steel, joists, etc. shall not be erected on concrete or masonry footings, piers, walls, etc. less than 7 days old or less than 75% strength (concrete f'_c or masonry f'_m) unless the concrete or masonry strength criteria that have been established by the **SER** for carrying such loads are satisfied.

SIFC-602 FABRICATION AND ERECTION DOCUMENTS

SIFC-602.1 Review and approval. The structural steel fabrication and erection documents shall be submitted for review and approval to the **SER** and to **FCCSS** prior to fabrication and erection of steel elements. The **GC** shall submit two sets of **SER**-approved fabrication and erection documents to **FCCSS** for approval. After County review and approval, **FCCSS** will return one set of County-approved fabrication and erection documents for use on the job site. County-approved documents shall be used by the **SER** to conduct special inspections during construction.

SIFC-602.2 Preparation of fabrication and erection documents. The structural steel fabrication and erection documents shall include designs and details for welded and bolted connections. Details for welded connections shall clearly indicate the seismic-force-resisting elements of buildings of Seismic Category C. Details for bolted connections shall clearly indicate the type of connection used in the design (bearing or slip-critical), the amount of tensioning required (snug tight or fully tensioned) and the ASTM specifications for the bolts, nuts and washers.

SIFC-602.3 SER review and approval. The structural steel fabrication and erection documents shall be reviewed and approved by the **SER** in accordance with the following requirements:

a. Review and approval stamp. Each fabrication and erection document shall bear the review and approval stamp of the **SER** or be otherwise individually identified as being reviewed and approved (see SIFC-103).

b. Primary structural system. The **SER** shall review and approve the submitted documents for compliance with County-approved construction documents, including the review and approval of any connections developed by the steel fabricator. The **SER** shall indicate

approval with a signed and sealed statement, attached to the documents, accepting responsibility for the design of connections which shall include language as given in either:

"The structural steel fabrication and erection documents have been reviewed, including a verification of all the structural steel connections shown. Where marked "Approved" or "Approved as Noted", I accept full responsibility for the design of the connections to support the design loads required by the County-approved construction documents for the completed project."

or

"I have reviewed the structural steel fabrication and erection documents (list) as prepared by (company) for the above referenced project. My review and approval, or approval as noted, dated (date), included a verification of all the structural steel connections shown. I accept the responsibility for the design of the connections to support the design loads required by the County-approved construction documents for the completed project."

c. Secondary structural elements. Secondary structural elements are required to be reviewed and approved by the **SER** only for their effects on the primary structural system.

SIFC-603 INSPECTION OF STEEL FABRICATORS

SIFC-603.1 Steel fabricators. The **SIER** shall provide special inspection of the steel fabricator and fabrication procedures, and of the fabricated items, as required by IBC-1704.2 (see SIFC-302.1).

SIFC-603.2 Fabrication procedures.

a. Certification. The fabricator may demonstrate to the **SIER** that the requirements of IBC-1704.2 have been met by furnishing evidence of compliance with the AISC Quality Certification Program in the appropriate category.

b. Procedures implementation. The **SIER** shall verify in writing to **FCCSS** that the fabricator is properly implementing the fabrication and quality control procedures outlined above. Verification may be on a job basis or by inspection within the previous twelve months.

SIFC-604 INSPECTION OF STEEL ELEMENTS

SIFC-604.1 Material receiving. The **SIER** shall inspect steel elements, welding material, and high strength bolts for conformance with IBC-Table 1704.3. High strength bolts and nuts shall be clearly marked with an identifiable manufacturer's mark on both the bolt head and nut. All shipments of high-strength bolts, nuts, and washers, whether from manufacturer, distributor, or reseller, shall include manufacturer's current test reports for chemical composition (ASTM A 751) and mechanical properties, including proof load testing (ASTM F 606).

SIFC-604.2 Steel elements. The **SIER** shall inspect steel elements in accordance with IBC-1704.3.

IBC-1704.3 Steel construction. The special inspections for steel elements of buildings and structures shall be as required by Section 1704.3 and Table 1704.3. Where required, special inspection of steel shall also comply with Section 1715.

Exceptions:

1. Special inspection of the steel fabrication process shall not be required where the fabricator does not perform any welding, thermal cutting or heating operation of any kind as part of the fabrication process. In such cases, the fabricator shall be required to submit a detailed procedure for material control that demonstrates the fabricator's ability to maintain suitable records and procedures such that, at any time during the fabrication process, the material specification, grade and mill test reports for the main stress-carrying elements are capable of being determined.
2. The special inspector need not be continuously present during welding of the following items, provided the materials, welding procedures and qualifications of welders are verified prior to the start of the work; periodic inspections are made of the work in progress; and a visual inspection of all welds is made prior to completion or prior to shipment of shop welding.
 - 2.1. Single pass fillet welds not exceeding $\frac{5}{16}$ inch (7.9 mm) in size.
 - 2.2. Floor and roof deck welding.
 - 2.3. Welded studs when used for structural diaphragm.
 - 2.4. Welded sheet steel for cold-formed steel framing members such as studs and joists.
 - 2.5. Welding of stairs and railing systems.

IBC-1704.3.1 Welding. Welding inspection shall be in compliance with AWS D1.1. The basis for welding inspector qualification shall be AWS D1.1.

IBC-1704.3.2 Details. The special inspector shall perform an inspection of the steel frame to verify compliance with the details shown on the approved construction documents, such as bracing, stiffening, member locations and proper application of joint details at each connection.

IBC-1704.3.3 High-strength bolts. Installation of high strength bolts shall be periodically inspected in accordance with AISC specifications.

IBC-1704.3.3.1 General. While the work is in progress, the special inspector shall determine that the requirements for bolts, nuts, washers, and paint; bolted parts; and installation and tightening in such standards are met. For bolts requiring pretensioning, the special inspector shall observe the pre-installation testing and calibration procedures when such procedures are required by the installation method or by project plans or specification; determine that all plies of connected materials have been drawn together and properly snugged; and monitor the installation of bolts to verify that the selected procedure for installation is properly used to tighten bolts. For joints required to be tightened only to the snug tight condition, the special inspector need only verify that the connected materials have been drawn together and properly snugged.

IBC-1704.3.3.2 Periodic monitoring. Monitoring of bolt installation for pretensioning is permitted to be performed on a periodic basis when using the turn-of-nut method with matchmarking techniques, the direct tension indicator method, or the alternate design fastener (twist-off bolt) method. Joints designated as snug tight need be inspected only on a periodic basis.

IBC-1704.3.3.3 Continuous monitoring. Monitoring of bolt installation for pretensioning using the calibrated wrench method or the turn-of-nut method without matchmarking shall be performed on a continuous basis.

IBC-TABLE 1704.3
REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD ^a	IBC REFERENCE
1. Material verification of high-strength bolts, nuts, and washers:		X	Applicable ASTM material specifications;	
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	—		AISC ASD, Section A3.4; AISC LRFD, Section A3.3	—
b. Manufacturer's certificate of compliance required.				
2. Inspection of high-strength bolting:			AISC LRFD, Section M2.5	1704.3.3
a. Bearing-type connections.		X		
b. Slip-critical connections.	X	X		
Material verification of structural steel:				1708.4
a. Identification markings to conform to ASTM standards specified in the approved construction documents.			ASTM A 6 or ASTM A 568	
b. Manufacturers' certified mill test reports required.	—	—	ASTM A 6 or ASTM A 568	
4. Material verification of weld filler materials:				
a. Identification markings to conform to AWS specification in the approved construction documents.			AISC ASD, Section A3.6; AISC LRFD, Section A3.5	
b. Manufacturer's certificate of compliance required.	—	—		—
5. Inspection of welding:			AWS D1.1	1704.3.1
a. Structural steel:				
1) Complete and partial penetration groove welds	X			
2) Multi-pass fillet welds	X			
3) Single-pass fillet welds $> \frac{5}{16}$ " (7.9 mm)	X			
4) Single-pass fillet welds $< \frac{5}{16}$ " (7.9 mm)		X		
5) Floor and deck welds		X		
b. Reinforcing steel:			AWS D1.3 AWS D1.4 ACI 318: 3.5.2	1704.3.1
1) Verification of weldability of reinforcing steel other than ASTM A 706.		X		
2) Reinforcing steel-resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special reinforced concrete shear walls, and shear reinforcement.	X			
3) Shear reinforcement.		X		
4) Other reinforcing steel.	X			
6. Inspection of steel frame joint details for compliance with approved construction documents:		X		1704.3.2
a. Details such as bracing and stiffening.	—		—	
b. Member locations.				
c. Application of joint details at each connection.				

For SI: 1 inch = 25.4 mm.

a. Where applicable, see also Section 1707.1, Special inspection for seismic resistance.

SIFC-604.3 Erection. The **SIER** shall perform special inspections of anchor bolts, bolts, welding, connections, and details. Any observed discrepancies between the County-approved construction documents and the County-approved structural steel fabrication and erection documents shall be brought to the immediate attention of the **SER** and **FCCSS**. All steel elements shall be inspected before they are covered by sprayed fire-resistant materials, or are otherwise concealed.

a. High strength bolts. Installation shall conform to the County-approved construction documents, County-approved structural steel fabrication and erection documents, and the *RCSC/AISC Specification for Structural Joints Using A325 or A490 Bolts*.

In the event any bolt, nut, or washer is broken during normal installation (except bolts purposely over-torqued in order to draw the parts together), the **SIER** shall bring such failures to the immediate attention of the **SER** and **FCCSS**. The **SIER** shall observe the on-job-site proof load testing of any suspect bolt(s) per ASTM and AISC standards. Should the bolts fail load testing, they shall be rejected and the **SER** shall make recommendations in writing for remedial actions. All test results and recommendations shall be reported to **FCCSS**.

b. Welding. All welders and weld special inspectors shall be certified in accordance with AWS D1.1. Weld inspection shall be in conformance with IBC-1704.3.1 and IBC-Table 1704.3 Item 5.

c. Rigid or semi-rigid connections. When field welding of rigid or semi-rigid connections is required, or when bolted connections are required to meet a minimum pretension beyond snug tight, the **SIER** shall conduct special inspections of the connections.

d. Details: The **SIER** shall perform inspections of the steel frame to verify compliance with the details shown on the County-approved construction documents and the County-approved fabrication and erection documents, such as bracing, stiffening, member locations, and proper application of joint details at each connection.

e. Composite construction: The **SIER** shall inspect shoring for composite construction (see SIFC-702.3 and IBC-Table 1704.4 Item 11 for design and inspection requirements).

SIFC-605 COMPLETION OF STRUCTURAL STEEL CONSTRUCTION

Upon completion of structural steel construction, including connections, the **SIER** shall, after review and approval by the **SER**, submit a completion letter to **FCCSS** and shall indicate the date of completion on the final report of special inspections.

CHAPTER 7 CAST-IN-PLACE CONCRETE

SIFC-701 GENERAL

SIFC-701.1 Scope. The requirements of this chapter and IBC-1704.4 shall apply when construction includes cast-in-place concrete as listed in SIFC-302.3.

SIFC-701.2 Construction loads. The **GC** shall coordinate construction operations so that at all times the dead loads, live loads, and construction loads delivered to the building shall be within the capacity of the building to carry such loads. In addition, no structural loads shall be imposed on any vertical load carrying member which is less than seven days old unless the concrete strength criteria established by the **SER** for carrying such loads is satisfied.

SIFC-701.3 Posting of concrete pour schedule. As construction proceeds, the **GC** shall post the updated concrete pour schedule, which shall indicate building floor level, pour number, and date of pour, on the door of the **GC's** field office. This schedule will be used, in case of fire, by the Fairfax County Fire and Rescue Department.

SIFC-702 FABRICATION AND ERECTION DOCUMENTS

SIFC-702.1 Review and approval. The cast-in-place concrete fabrication and erection documents, including concrete mix designs, shall be submitted for review and approval to the **SER** and to **FCCSS** prior to concrete construction and/or formwork erection, as appropriate. The **GC** shall submit two sets of **SER**-approved fabrication and erection documents to **FCCSS** for approval. After County review and approval, **FCCSS** will return one set of County-approved fabrication and erection documents for use on the job site. County-approved documents shall be used by the **SIER** to conduct special inspections during construction.

Exceptions:

1. **FCCSS** approval is not required for non-prestressed mild steel reinforcement. One set of **SER**-approved fabrication and erection documents shall be submitted to **FCCSS** for record purposes.
2. **FCCSS** approval is not required for concrete formwork as exempted in SIFC-702.3.a.

SIFC-702.2 Seal and signature requirements. The following fabrication and erection documents shall be prepared, signed and sealed by **RDPs**:

- Concrete formwork and shoring designs required by SIFC-702.3.
- Concrete formwork stripping and reshoring schedules required by SIFC-702.3.
- Prestressing steel to be post-tensioned.

SIFC-702.3 Formwork design requirements. A **RDP** with experience in the design of formwork and shoring shall prepare, sign and seal fabrication and erection documents, including calculations, specifying formwork and shoring requirements, stripping criteria, and reshoring procedures for structural concrete slabs, beams, walls, and columns, except as exempted in SIFC-702.3.a. The fabrication and erection documents shall indicate formwork system requirements, including construction schedules, shoring design and layout, shoring removal,

and reshoring requirements. The design shall include the construction loads to be delivered to the building during construction and shall indicate the strengths of the building elements assumed for formwork and shoring designs, and stripping and reshoring schedules.

a. Walls and columns. Unless required by project specifications or the **SER**, formwork design for walls and columns is only required for walls in excess of 10 feet in height, columns in excess of 15 feet in height, or walls and columns whose formwork supports scaffolding at heights greater than 10 feet above any surrounding surface. Stripping requirements do not apply to walls and columns of any height unless such elements will carry loads other than their own weight at time of stripping or unless required by project specifications or the **SER**.

b. Composite construction. Shoring for composite slabs and/or beams shall be designed to meet the **SER**'s requirements.

SIFC-702.4 SER review and approval. Prior to concrete construction and/or formwork erection, as appropriate, the fabrication and erection documents listed below shall be reviewed and approved by the **SER**:

- Concrete formwork and shoring designs required by SIFC-702.3: for compatibility with the County-approved structural construction documents and for construction loads delivered to the building.
- Concrete stripping and reshoring designs and schedules required by SIFC-702.3: to verify the capacity of the building components, exclusive of the formwork, to carry the construction loads.
- Non-prestressed mild steel reinforcement.
- Prestressing steel to be post-tensioned.
- Concrete mix designs, including any accelerators or other admixtures, for each class of concrete to be used. **SER** Approval shall include the following language:

"I have reviewed the concrete mix designs as prepared by (company) for the above referenced project. My review and approval or approval as noted, dated (date), included review and approval of the concrete mix designs (list), including any accelerators or other admixtures, for each class of concrete to be used, for compliance with project requirements."

SIFC-703 INSPECTIONS

SIFC-703.1 Special inspections. The **SIER** shall perform special inspections in accordance with this chapter, IBC-1704.4 and IBC-Table 1704.4 as amended by VUSBC. IBC-Table 1704.4 Item 2, *Reinforcing steel welding* requires continuous or periodic inspection, depending upon the use of the reinforcing steel. (see SIFC-604.2 and IBC-Table 1704.3 Item 5b). IBC-Table 1704.4 Item 11, *Formwork and shoring* requires periodic special inspection.

IBC-1704.4.1 Materials. In the absence of sufficient data or documentation providing evidence of conformance to quality standards for materials in Chapter 3 of ACI 318, the building official shall require testing of materials in accordance with the appropriate standards and criteria for the material in Chapter 3 of ACI 318. Weldability of reinforcement, except that which conforms to ASTM A 706, shall be determined in accordance with the requirements of Section 1903.5.2.

IBC-TABLE 1704.4
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD ^a	IBC REFERENCE
1. Inspection of reinforcing steel, including prestressing tendons, and placement.	—	X	ACI 318: 3.5, 7.1-7.7	1903.5, 1907.1,1907.7 1914.4
2. Inspection of reinforcing steel welding in accordance with Table 1704.3, Item 5B.	—	—	AWS D1.4 ACI 318: 3.5.2	1903.5.2
3. Inspect bolts to be installed in concrete prior to and during placement of concrete where allowable loads have been increased.	X	—	—	1912.5
4. Verifying use of required design mix.	—	X	ACI 318: Ch. 4, 5.2-5.4	1904, 1905.2-1905.4 1914.2,1914.3
5. Sampling fresh concrete and performing slump, air content and determining the temperature of fresh concrete at the time of making specimens for strength tests.	X	—	ASTM C 172 ASTM C 31 ACI 318: 5.6, 5.8	1905.6, 1914.10
6. Inspection of concrete and shotcrete placement for proper application techniques.	X	—	ACI 318: 5.9, 5.10	1905.9, 1905.10, 1914.6,1914.7 1914.8
7. Inspection for maintenance of specified curing temperature and techniques.	—	X	ACI 318: 5.11-5.13	1905.11, 1905.13, 1914.9
8. Inspection of prestressed concrete:				
a. Application of prestressing forces.	X		ACI 318: 18.18	—
b. Grouting of bonded prestressing tendons in the seismic-force-resisting system.	X	—	ACI 318: 18.16.4	
9. Erection of precast concrete members.	—	X	ACI 318: Ch. 16	—
10. Verification of in-situ concrete strength, prior to stressing of tendons in posttensioned concrete and prior to removal of shores and forms from beams and structural slabs.	—	X	ACI 318: 6.2	1906.2
11. Inspection of concrete formwork, shoring and re-shoring.	—	X	ACI 318: 6.1, 6.2	1906

a. Where applicable, see also Section 1707.1, Special inspection for seismic resistance.

SIFC-703.2 Particular Elements.

a. Concrete formwork. The **SIER** shall verify that the formwork materials, cleanliness, size, and installation conform to approved formwork fabrication and erection documents, prior to placement of concrete. Inspection reports shall be submitted to **FCCSS** within three working days of each inspection.

b. Reinforcing steel. The **SIER** shall verify that reinforcing steel is in compliance with County-approved construction documents and approved fabrication and erection documents, including welding of reinforcement of the structural seismic-force-resisting system.

c. Tendons to be post-tensioned. The **SIER** shall verify that tendons to be post-tensioned are in compliance with County-approved construction documents and approved fabrication and erection documents, including full-time monitoring of grouting, consolidation and reconsolidation of bonded prestressing tendons. Inspections shall include tendon size and strength, chair height, tendon profile, tendon snaking elimination, horizontal ties between chairs and condition of sheathing.

d. Stressing of tendons. The **SIER** shall verify that tendon stressing operations are in compliance with project specifications. Stressing of tendons shall not start before the specified minimum strength of field-cured test cylinders has been achieved and verified by the **SIER** and approved by the **SER**. Continuous monitoring of stressing of tendons is required. Elongation records shall be made and checked against project specifications. Tendon failures or tendon elongations not in compliance with project specifications shall be rejected and the **SER** shall make recommendations in writing for remedial actions.

e. Concrete. The **SIER** shall verify use of proper concrete design mix, monitor placement of concrete, and perform inspections and testing listed in IBC-Table 1704.4. Continuous monitoring shall be required at the point of discharge from trucks / batch plant, and at the point of deposit / consolidation of concrete.

f. Weldability of reinforcement. If steel reinforcement other than ASTM A 706 is to be welded, the **SIER** shall verify that the weldability of the reinforcement has been determined in accordance with IBC-1903.5.2.

g. Welding of reinforcement. Special inspection of welding of reinforcement is required in accordance with **both** IBC-Table 1704.4 Item 2 **and** IBC-Table 1704.3 Item 5B. Continuous monitoring of welding of reinforcing steel shall be provided where required by IBC-Table 1704.3 Item 5B.

SIFC-704 TESTING

Concrete shall be tested in accordance with IBC-1905.6 and this section.

IBC-1905.6 Evaluation and acceptance of concrete. The criteria for evaluation and acceptance of concrete shall be as specified in Sections 1905.6.2 through 1905.6.5.5.

IBC-1905.6.1 Qualified technicians. Concrete shall be tested in accordance with the requirements in Sections 1905.6.2 through 1905.6.5. Qualified field testing technicians shall perform tests on fresh concrete at the job site, prepare specimens required for curing under field conditions, prepare specimens required for testing in the laboratory, and record the temperature of the fresh concrete when preparing specimens for strength tests. Qualified laboratory technicians shall perform all required laboratory tests.

IBC-1905.6.2 Frequency of testing. The frequency of conducting strength tests of concrete shall be as specified in Sections 1905.6.2.1 through 1905.6.2.4.

IBC-1905.6.2.1 Minimum frequency. Samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, nor less than once for each 150 cubic yards (115 m³) of concrete, nor less than once for each 5,000 square feet (465 m²) of surface area for slabs or walls.

IBC-1905.6.2.2 Minimum number. On a given project, if the total volume of concrete

is such that the frequency of testing required by Section 1905.6.2.1 would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.

IBC-1905.6.2.3 Small volume. When the total volume of a given class of concrete is less than 50 cubic yards (38 m³), strength tests are not required when evidence of satisfactory strength is submitted to and approved by the building official.

IBC-1905.6.2.4 Strength test. A strength test shall be the average of the strengths of two cylinders made from the same sample of concrete and tested at 28 days or at the test age designated for the determination of f'_c .

IBC-1905.6.3 Laboratory-cured specimens. Laboratory-cured specimens shall comply with the provisions of Sections 1905.6.3.1 through 1905.6.3.4.

IBC-1905.6.3.1 Sampling. Samples for strength tests shall be taken in accordance with ASTM C 172.

IBC-1905.6.3.2 Cylinders. Cylinders for strength tests shall be molded and laboratory cured in accordance with ASTM C 31 and tested in accordance with ASTM C 39.

IBC-1905.6.3.3 Acceptance of results. The strength level of an individual class of concrete shall be considered satisfactory if both of the following requirements are met:

1. Every arithmetic average of any three consecutive strength tests equals or exceeds f'_c .
2. No individual strength test (average of two cylinders) falls below f'_c by more than 500 psi (3.45 MPa).

IBC-1905.6.3.4 Correction. If either of the requirements of Section 1905.6.3.3 are not met, steps shall be taken to increase the average of subsequent strength test results. The requirements of Section 1905.6.5 shall be observed if the requirement of Section 1905.6.3.3, Item 2 is not met.

IBC-1905.6.4 Field-cured specimens. Field-cured specimens shall comply with the provisions of Sections 1905.6.4.1 through 1905.6.4.4.

IBC-1905.6.4.1 When required. Where required by the building official, the results of strength tests of cylinders cured under field conditions shall be provided.

IBC-1905.6.4.2 Curing. Field-cured cylinders shall be cured under field conditions in accordance with ASTM C 31.

IBC-1905.6.4.3 Sampling. Field-cured test cylinders shall be molded at the same time and from the same samples as laboratory-cured test cylinders.

IBC-1905.6.4.4 Correction. Procedures for protecting and curing concrete shall be improved when the strength of field-cured cylinders at the test age designated for determination of f'_c is less than 85 percent of that of companion laboratory-cured cylinders. The 85 percent limitation shall not apply if the field-cured strength exceeds f'_c by more than 500 psi (3.45 MPa).

IBC-1905.6.5 Low-strength test results. The investigation of low-strength test results shall be in accordance with the provisions of Sections 1905.6.5.1 through 1905.6.5.5.

IBC-1905.6.5.1 Precaution. If any strength test (see Section 1905.6.2.4) of laboratory-cured cylinders falls below the specified value of f'_c by more than 500 psi (3.45 MPa) (see Section 1905.6.3.3, Item 2), or if tests of field-cured cylinders indicate deficiencies in protection and curing (see Section 1905.6.4.4), steps shall be taken to assure that the load-carrying capacity of the structure is not jeopardized.

IBC-1905.6.5.2 Core tests. If the likelihood of low-strength concrete is confirmed and calculations indicate that load-carrying capacity is significantly reduced, tests of cores drilled from the area in question in accordance with ASTM C 42 is permitted. In such cases, three cores shall be taken for each strength test more than 500 psi (3.45 MPa) below the specified value of f'_c .

IBC-1905.6.5.3 Condition of cores. If concrete in the structure will be dry under service conditions, cores shall be air dried at temperatures between 60°F (16°C) and 80°F (27°C) and relative humidity less than 60 percent for seven days before testing and shall be tested dry. If concrete in the structure will be more than superficially wet under service conditions, cores shall be immersed in water for at least 40 hours and be tested wet.

IBC-1905.6.5.4 Test results. Concrete in an area represented by core test shall be considered structurally adequate if the average of three cores is equal to at least 85 percent of f'_c and if no single core is less than 75 percent of f'_c . Additional testing of cores extracted from locations represented by erratic core strength results is permitted.

IBC-1905.6.5.5 Strength evaluation. If the criteria of Section 1905.6.5.4 are not met and if the structural adequacy remains in doubt, the building official is permitted to order a strength evaluation in accordance with ACI 318, Chapter 20, for the questionable portion of the structure, take other appropriate action.

SIFC-704.1 Testing required. Material tests for concrete properties and strength, for determining the compressive strength of concrete, prior to removal of concrete formwork and shoring, reshoring, stressing post-tensioning tendons, loading of vertical building elements, erection of structural steel, and for verifying adequacy of concrete protection and curing methods during cold weather, shall comply with the following:

a. Frequency of testing. Samples for strength tests of each class (concrete mix design) shall be taken in accordance with IBC-1905.6.2. Concrete samples for test cylinders shall be taken in accordance with ASTM C 172. Additional test cylinders for strength tests shall be cast if required by the **AR**, **SER**, or County-approved documents. Additional cylinders to be field-cured shall be required to evaluate strengths of concrete prior to removal of shores and concrete formwork, prior to stressing of post-tensioning tendons, loading of vertical building elements, erection of structural steel, and adequacy of concrete curing and protection methods during cold weather concreting conditions.

b. Laboratory-cured cylinders. Cylinders for strength tests shall comply with this section and IBC-1905.6.3. Cylinders for strength tests shall be cast, stored, transported and laboratory-cured in accordance with ASTM C 31. Tests shall be in accordance with ASTM C 39.

c. Field-cured cylinders. Field-cured cylinders, to evaluate strengths of concrete prior to removal of concrete formwork and shoring, reshoring, prior to stressing post-tensioning tendons, and to determine adequacy of curing and protection of concrete during cold

weather, shall comply with this section and IBC-1905.6.4. Field-cured cylinders shall be cured as closely as possible to the location of placement of the concrete pour they represent, and be exposed as nearly as possible to the same temperature and moisture environment, in accordance with ACI 318 and ASTM C 31. Tests shall be in accordance with ASTM C 39.

Cylinders may be fabricated on the ground or on the slab, and moved to the curing location no more than 30 minutes after fabrication. If fabricated on the ground, cylinders shall be placed in a temporary open storage location, protected by no more than insulated blankets, remain undisturbed for a minimum of 16 hours but no more than 24 hours after molding, and then be relocated into or on the structure as closely as is practicable to the concrete they represent. If molded on the slab, cylinders shall be placed into or on the structure as closely as is practicable to the concrete they represent immediately after molding.

Equivalency may be achieved by storing uncapped cylinders on or immediately adjacent to the structural concrete placement as soon as practical after casting (and until six hours or less prior to testing), and subjecting them to the same temperature and moisture loss controls as the structure itself. Test cylinders shall be protected from cold weather and cured in the same manner as the concrete they represent. Under no circumstances shall field-cured cylinders be subjected to a curing environment that is better than the concrete they represent, such as placement within a temperature and/or humidity controlled container.

SIFC-704.2 Low-strength concrete test results. Investigation of low-strength concrete shall be in accordance with IBC-1905.6.5 and this section. The following procedures shall apply when test results do not comply with the acceptance criteria of ACI 318 for concrete strength.

a. Submittal of data and recommendations to FCCSS. The **SIER** shall submit to **FCCSS** a copy of any records pertaining to under-strength concrete, with written recommendations of the **SER**.

b. Non-destructive testing. If non-destructive testing is recommended by the **SER** to confirm the existence or evaluate the in-situ strength of low-strength concrete, **FCCSS** will only accept testing by concrete cores obtained and tested in accordance with ASTM C 42 and conditioned in accordance with IBC-1905.6.5.3, or by penetration resistance in accordance with ASTM C 803 (Windsor Probes). The impact rebound hammer (Swiss Hammer or ASTM C 805) method of testing shall not be approved by **FCCSS**.

SIFC-705 CONCRETE FORMWORK: STRIPPING AND RESHORING

SIFC-705.1 FCCSS approval required. Specific **FCCSS** approval is required prior to removal of concrete formwork and shoring, and installation or removal of reshores. Requests for **FCCSS** approval shall be submitted in the form of stripping letters (see SIFC-705.3).

Exception: Stripping approval is not required for certain walls and/or columns, as listed in SIFC-702.3.a.

SIFC-705.2 Operations. Removal of shores, formwork stripping, and installation of reshores shall conform to the County-approved fabrication and erection documents and shall not commence until the **FCCSS**-approved stripping letter is on-site.

SIFC-705.3 Requests for formwork and shoring removal (stripping letter).

a. Preparation of stripping letter. The **SIER** shall initiate a stripping letter when concrete strengths have achieved the levels specified by the County-approved documents, requesting approval for removal of shores and formwork, and/or reshoring operations. This letter shall

contain the test results of the field-cured cylinders (and laboratory-cured cylinders when specified by the **SER**) molded for this purpose along with the stripping requirements stated in the County-approved documents. The stripping letter shall contain the original seal and signature of the **SIER**.

A stripping letter shall state that in-situ concrete strengths and conditions meet or exceed the project design specifications and design stripping criteria, and shall request approval to remove formwork and/or shoring. In the event of a deficiency, the **SER's** recommendations shall be included. Stripping letters shall also include the following:

- **"Design" data.** The project's requirements, including but not limited to the concrete mix design strength and concrete strength/time specifications for stripping, the formwork shoring, reshoring or stripping design criteria established by the **RDP** responsible for formwork and shoring design, and cold weather concreting methods.
- **"Actual" data.** The construction results attained for the particular stripping request, including but not limited to cold weather concreting temperature logs, concrete cylinder break tests, post-tensioning stressing records, and formwork shoring/reshoring data or calculations.

b. Approval of stripping letter. **FCCSS** approval of the stripping letter is required prior to shoring removal, stripping and reshoring operations. Possession of this County-approved stripping letter does not in any way relieve the **GC** of responsibility to evaluate the removal of formwork and shoring to determine if it is safe and appropriate to do so.

The stripping letter shall be reviewed and approved by the **SER** prior to submittal to **FCCSS**. Except for post-tensioned concrete construction, the **SER** may waive review of the stripping letter. Waiver of review constitutes **SER** approval of the stripping letter. The **SER** waiver of review shall be conveyed to **FCCSS** in writing prior to commencement of concrete placement for the project.

SIFC-705.4 Low-strength concrete. When field-cured concrete strength test results do not meet formwork and shoring removal requirements, the **RDP** who designed concrete formwork and shoring may review any additional available information and make a recommendation to the **SER** and to **FCCSS** to allow stripping to proceed, or to postpone stripping until specified concrete strengths are attained. **SER** approval and **FCCSS** approval is required.

SIFC-705.5 Elongation records. When structural members to be stripped are of post-tensioned design, elongation records shall be approved by the **SER** and shall be attached to the stripping letter. In the event that tendons are broken, elongations do not meet project specifications, or other deficiencies occur, the **RDP** who designed the post-tensioned tendons shall address the case and make a recommendation, for review and approval by both the **SER** and **FCCSS**.

SIFC-706 COLD WEATHER CONCRETING

SIFC-706.1 When required. The requirements of this section shall apply after three consecutive days of average daily temperatures below 40°F, or when the internal concrete temperature falls below 50°F during curing. The **GC** shall make specific provisions to continuously protect the concrete during cold weather periods. During periods when the average daily temperatures are intermittently above and below 40°F, provisions for protection, as needed, shall be available.

The **SIER** shall verify adherence to the following requirements:

- **Minimum temperature of concrete.** All concrete (slabs, columns, walls, beams, footings,

etc.) shall be maintained above 50°F and be kept moist during the first seven (7) days (or three (3) days if high-early strength concrete is used) after placement.

- **Maximum temperature in enclosures.** If the area is enclosed, the temperature in the enclosure shall be monitored so that it does not exceed 104°F, or as otherwise specified by the **SER**. Proper moisture levels shall be maintained at all times.
- **Environment of field-cured cylinders.** When cylinders are fabricated for acceptance testing, additional cylinders shall be made to be field-cured for purposes of determining adequacy of protection and curing (see IBC-1905.6.4). Field-cured concrete cylinders shall be cured in the identical environment, and the least favorable curing conditions, as the structural members they represent. Each set of field-cured cylinders shall remain in the exact curing environment of the structural members they represent for 100% of the minimum curing time required by the **SER** prior to transport to the approved testing laboratory for compressive strength testing.

SIFC-706.2 Temperature readings and records.

a. Temperature readings required. The **SIER** shall record ambient temperature, air temperature under slab (when applicable), and concrete temperatures at regular time intervals on all concrete until 72 cumulative hours of internal concrete temperatures above 50°F are achieved, or until the average ambient temperature rises above 40°F for more than three successive days. Temperature readings shall be taken by personnel of the **SIER**, using tamper-resistant devices. Concrete temperature readings shall be taken at a minimum of four locations along the edge of the slab being monitored. **FCCSS** may designate additional locations if the concrete pour is unusually large. Temperature readings and appropriate data shall be recorded on a temperature log sheet which shall be attached to each stripping letter to facilitate the review and approval of the stripping request.

b. Frequency. Periodic readings of temperatures are required to verify adequacy of curing and protection methods. During the season when temperatures are not within the “cold weather concreting” conditions, high and low readings of concrete temperatures shall be provided once for each 24-hour period. Such readings shall be labeled, “not cold weather”. During “cold weather concreting” conditions, the **SIER** shall monitor ambient temperature, air temperature under slab, and concrete temperatures at regular time intervals for the specified duration of temperature controlled curing. The concrete curing time begins when the last load of concrete is deposited into the formwork, with temperature monitoring beginning immediately after concrete placement and finishing is complete and continuing until the cumulative duration of satisfactory curing is achieved.

If instantaneous temperature readings only are recorded, there shall be not less than six recordings per 24-hour period (at 4 hour intervals). If there are less than six recordings per 24-hour period, recordings shall include the instantaneous temperature and also include both minimum-maximum temperatures reached during the previous recording period, with not less than two recordings per 24-hour period (12-hour intervals). In all cases, if the temperature reading(s) indicate a minimum concrete temperature below 50°F then that period of time between readings cannot be included in the required curing duration.

c. Use of automatic recorders. Automatic temperature monitoring and maturity metering devices may be used only to verify the temperature data required by SIFC-706.2.a.

SIFC-706.3 Testing of field-cured cylinders for curing. For cold-weather concreting, testing of field-cured cylinders is required, to verify adequacy of curing and protection measures. The testing shall be done at twenty-eight days or the time designated on the County-approved documents for determination of specified compressive strength of concrete, f'_c , if different from twenty-eight days. Cylinders cured in the field for purposes of determining formwork and shoring removal may be used to satisfy this requirement.

SIFC-707 COMPLETION OF CAST-IN-PLACE CONCRETE CONSTRUCTION

Upon completion of cast-in-place concrete construction, the **SIER** shall, after review and approval by the **SER**, submit a completion letter to **FCCSS** and shall indicate the date of completion on the final report of special inspections.

FORMWORK / SHORING STRIPPING / STRESSING FCCSS AUTHORIZATION REQUEST

PROJECT DATA:

Permit No. _____	Job File No. _____
Name _____	General Contr. _____
Address _____	Concrete Contr. _____

POUR DATA:

Mix Designation _____	Strength (psi) _____
Date & Time _____	Volume (cy) _____
Location _____	

STRIPPING DATA:

Design/Required	Actual	Satisfactory/ Unsatisfactory
-----------------	--------	---------------------------------

Age (hrs,days) and/or	_____	_____	_____
Avg. Temp (f) and/or	_____	_____	_____
Strength (psi)	_____	_____	_____

STRESSING DATA:

Concrete Strength	_____	_____	_____
Tendon Elongation	_____	_____	_____

ATTACHMENTS:

Key Plan	_____
Concrete Break Plan	_____
Stressing Record	_____
Temperature Log	_____
Stripping Criteria	_____
Stripping Authorization	_____
Other:	_____

NOTES:

Signature & Seal of Special Inspections Engineer of Record

COLD WEATHER CONCRETE SLAB TEMPERATURE LOG

PLACEMENT DATE:		PROJECT _____ PERMIT # _____						
		DESCRIPTION OF POUR _____						
FINISH TIME:		Station #1	Station #2	Station #3	Station #4	Air Temp Und Slab	Ambient Air Temp	Remarks
DAY 1	12 am							
	4 am							
	8 am							
	12 pm							
	4 pm							
	8 pm							
DAY 2	12 am							
	4 am							
	8 am							
	12 pm							
	4 pm							
	8 pm							
DAY 3	12 am							
	4 am							
	8 am							
	12 pm							
	4 pm							
	8 pm							
DAY 4	12 am							
	4 am							
	8 am							
	12 pm							
	4 pm							
	8 pm							
1) Maintain data for 72 hours after finish of placement. 2) Number of temperature monitoring stations may be increased as needed. 3) Stations shall be located near the outer edges.								

CHAPTER 8 PRECAST CONCRETE

SIFC-801 GENERAL

SIFC-801.1 Scope. The requirements of this chapter, IBC-1704.4, and IBC-Table 1704.4 Item 9 shall apply when construction includes precast concrete building elements as listed in SIFC-302.4.

SIFC-801.2 Precast concrete fabrication. Fabricators for off-site precast concrete elements shall be subject to special inspections as required by SIFC-302.1 and SIFC-803 and IBC-1704.2. Site-cast precast concrete elements shall be subject to special inspections during fabrication as required by SIFC-2000 Chapter 7 and SIFC-804.1, and IBC-1704.4.

SIFC-801.3 Precast concrete erection. Precast concrete elements shall be subject to special inspections during erection as required by SIFC-804.2 and IBC-Table 1704.4 Item 9.

SIFC-802 FABRICATION AND ERECTION DOCUMENTS

SIFC-802.1 Review and approval. The concrete mix designs shall be submitted to the **RDP** responsible for preparation of precast concrete designs and the **AR**, **SER** and **FCCSS** for review and approval. The fabrication and erection documents shall be submitted to the **AR**, **SER** and **FCCSS** for review and approval prior to precast concrete elements' fabrication and/or erection, as appropriate. The **GC** shall submit two sets of **AR/SER**-approved fabrication and erection documents, including the concrete mix designs, to **FCCSS** for approval. After County review and approval, **FCCSS** will return one set of County-approved fabrication and erection documents for use on the job site. County-approved documents shall be used by the **SIER** to conduct special inspections during construction.

SIFC-802.2 Preparation of fabrication and erection documents. A **RDP** with experience in the design of precast concrete structures shall prepare, sign and seal fabrication and erection documents for precast concrete building elements, including but not limited to: design drawings and calculations, connection details, design of lifting inserts, rigging requirements, and erection bracing. Documents for site-cast precast concrete shall also include, but are not limited to: element fabrication, form removal, storage and transportation.

SIFC-802.3 AR and SER review and approval. The **AR** and the **SER** shall review the fabrication and erection documents and the concrete mix designs for compliance with the architectural and structural design of the building and the County-approved construction documents.

SIFC-803 INSPECTION OF PRECAST CONCRETE FABRICATORS

Where fabrication of precast concrete elements is being performed off-site on the premises of a fabricator's shop, special inspection of the fabricator is required (see SIFC-302.1 and IBC-1704.2). The **SIER** shall verify that the precast plant has a documented and implemented Quality Control Program and shall notify **FCCSS** in writing of his/her findings. The minimum

quality control program shall be in accordance with the Precast/Prestressed Concrete Institute (PCI) Plant Certification Program. Alternatively, the **SIER** may inspect the precast plant at appropriate intervals to verify that materials, methods, products, and quality control comply with project specifications, County-approved fabrication and erection documents and PCI MNL-116, "Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products," and/or PCI MNL-117, "Manual for Quality Control for Plants and Production of Architectural Precast Products."

SIFC-804 INSPECTION OF PRECAST CONCRETE ELEMENTS

The **SIER** shall perform special inspections of precast concrete building elements as required by the VUSBC, IBC-1704.4, and IBC-Table 1704.4 Item 9 during erection for conformance with County-approved documents.

SIFC-804.1 Site-cast precast concrete. During fabrication of site-cast precast concrete elements, the **SIER** shall verify the following:

- **Concrete.** Concrete complies with the County-approved concrete mix designs and the applicable provisions of SIFC-2000 Chapter 7 for cast-in-place concrete.
- **Compressive strength of field-cured cylinders.** The compressive strength of field-cured cylinders satisfies minimum strength requirements of the County-approved construction documents and the lifting requirements and lifting insert specifications of the County-approved fabrication and erection documents.
- **Reinforcing steel.** Reinforcing steel, including lifting inserts, is installed in accordance with County-approved documents.

SIFC-804.2 Erection: During erection of precast concrete elements, the **SIER** shall verify the following:

- **Assembly.** Precast concrete elements are lifted, assembled and braced in accordance with County-approved fabrication and erection documents.
- **Welders.** Welders and weld inspectors are certified in accordance with AWS D1.1, Chapter 5, Part C.
- **Connections.** All welded connections in the structural frame are in accordance with County-approved documents and applicable sections of the AWS D1.1 Welding Code, SJI Specifications, AISC, IBC, and VUSBC. All connections of architectural precast concrete elements in buildings exceeding 30 feet in height and assigned to Seismic Design Category D, E or F in accordance with IBC-1707.6.

SIFC-805 COMPLETION OF PRECAST CONCRETE CONSTRUCTION

Upon completion of architectural and structural precast concrete construction, the **SIER** shall, after review and approval by the **AR** and **SER**, submit a completion letter to **FCCSS** and shall indicate the date of completion on the final report of special inspections.

CHAPTER 9 WOOD

SIFC-901 GENERAL

SIFC-901.1 Scope. The requirements of this chapter and IBC-1704.6 shall apply when construction includes wood building elements as listed in SIFC-302.6.

IBC-1704.6 Wood construction. Special inspections of the fabrication process of wood structural elements and assemblies shall be in accordance with Section 1704.2.

SIFC-901.2 Wood erection. Wood prefabricated structural elements shall be subject to special inspections during erection as required by SIFC-904.

SIFC-902 FABRICATION AND ERECTION DOCUMENTS

SIFC-902.1 Preparation of fabrication and erection documents A **RDP** with experience in the design of prefabricated wood elements and assemblies shall prepare, sign and seal fabrication and erection documents for prefabricated wood elements. The fabrication and erection documents shall include, but are not limited to: design drawings and calculations, connection details, supports, rigging requirements and lifting procedures, and erection bracing and details. Permanent bracing systems for lateral stability shall be detailed and included in the fabrication and erection documents. Details for welded or bolted connections shall clearly indicate the seismic-resisting elements of buildings of Seismic Design Category C, D, E or F. Details for bolted connections shall clearly indicate the amount of tensioning required and the ASTM specifications for the nuts, bolts and washers.

SIFC-902.2 Review and approval. The wood prefabricated elements' fabrication and erection documents shall be submitted to the **AR**, **SER** and Fairfax County for review and approval prior to wood prefabricated elements' fabrication and/or erection, as appropriate. After County review and approval, the **GC** shall ensure that County-approved fabrication and erection documents are available for use on the job site. County-approved documents shall be used by the **SIER** to conduct special inspections during construction.

SIFC-902.2.1 AR and SER review and approval. The **AR** and the **SER** shall review the fabrication and erection documents for compliance with the architectural and structural design of the building and the County-approved construction documents. For prefabricated wood trusses, the **AR/SER** shall also submit a certification of compliance to the **BPRD**.

SIFC-902.2.2 County approval.

a. Structural glue-laminated members and sandwich panels. The **GC** shall submit two sets of **AR/SER**-approved fabrication and erection documents to **FCCSS** for approval. After County review and approval, **FCCSS** will return one set of County-approved fabrication and erection documents for use on the job site.

b. Prefabricated trusses. The **GC** shall submit three sets of **AR/SER**-approved fabrication and erection documents to **BPRD** for approval. At least one set shall bear the

original seal and signature of the **RDP** responsible for truss design. After County review and approval, **BPRD** will retain one set of County-approved fabrication and erection documents and return the others for use on the job site.

c. Prefabricated wood I-joists. County approval is not required for wood I-joists. **SER**-approved fabrication and erection documents shall be available for use on the job site.

SIFC-903 INSPECTION OF WOOD FABRICATORS

SIFC-903.1 Wood fabricators. The **SIER** shall provide special inspection of the wood fabricator and fabrication procedures, and of the fabricated items, as required by IBC-1704.2. Glue-laminated members and sandwich panels shall bear the mark of an approved agency.

a. Certification. The fabricator may demonstrate to the **SIER** that the requirements of IBC-1704.2 have been met by furnishing evidence of compliance with the Wood Truss Council of America's Quality Control Program, or its equivalent.

b. Fabricator approval. The **SIER** shall verify in writing to **FCCSS** that the fabricator is properly implementing the fabrication and quality control procedures outlined above. Verification may be on a job basis or by inspection within the previous twelve months.

c. Certificate of compliance. At the completion of fabrication, the fabricator shall submit a certificate of compliance to **FCCSS**.

SIFC-904 INSPECTION OF WOOD ELEMENTS

SIFC-904.1 Erection. The **SIER** shall perform special inspections of wood building elements during erection as required by the VUSBC for conformance with County-approved documents. The **SIER** shall verify the following:

SIFC-904.2 Connections. All connections of the seismic-resisting elements of buildings assigned to Seismic Category C, D, E, or F are in accordance with County-approved documents and applicable sections of the IBC and VUSBC. Special inspections shall include nailing, bolting, structural gluing or other fastening of the wood elements of the structural seismic-resisting system of all buildings, regardless of height, assigned to Seismic Design Category C, D, E or F, as required by IBC-1707.3.

SIFC-905 COMPLETION OF WOOD CONSTRUCTION

Upon completion of wood construction, including connections, the **SIER** shall, after review and approval by the **SER**, submit a completion letter to **FCCSS** and shall indicate the date of completion on the final report of special inspections.

CHAPTER 10 MASONRY

SIFC-1001 GENERAL

SIFC-1001.1 Scope. The requirements of this chapter and IBC-1704.5 shall apply when construction includes masonry building elements as listed in SIFC-302.5. All masonry construction shall comply with IBC-2104 (see SIFC-1004 for construction in cold or hot weather).

SIFC-1001.2 Loads. No structural loads shall be imposed on any vertical load carrying member which is less than seven days old or less than 75% strength (masonry f'_m) unless the masonry strength criteria established by the **SER** for carrying such loads are satisfied.

SIFC-1001.3 Protection during construction. Masonry construction shall comply with applicable VOSHA regulations, including:

a. Bracing of walls. See SIFC-1002 for construction bracing design requirements. All masonry walls over 8'-0" (2438 mm) in height shall be laterally braced to prevent overturning and collapse unless the wall has adequate permanent lateral support. Construction bracing shall be erected as soon as masonry construction exceeds 8'-0" (2438 mm) in height. The bracing shall not be removed for any reason, and shall remain in place until permanent supporting elements of the structure are in place.

b. Limited access zone. A limited access zone shall be established whenever a masonry wall is being constructed. Entry to the zone shall be limited to employees actively engaged in constructing the wall. No other persons shall be permitted to enter the zone.

- **Zone location and extent.** The zone shall be established prior to the start of construction of the wall, on the side of the wall which will be unscaffolded. The zone minimum width shall be greater than or equal to the maximum height of the wall to be constructed plus 4'-0" (1219 mm) additional, and the zone minimum length shall be greater than or equal to the entire length of the wall to be constructed.
- **Zone duration.** The zone shall remain in place until the wall is laterally supported to prevent overturning and collapse, either by construction bracing or adequate permanent supporting elements of the structure.

SIFC-1002 FABRICATION AND ERECTION DOCUMENTS

The masonry fabrication and erection documents, including construction bracing designs and mortar and grout mix designs, shall be submitted for review and approval to the **AR**, **SER** and **FCCSS** prior to masonry construction. The **GC** shall submit two sets of **SER**-approved fabrication and erection documents to **FCCSS**. After County review and approval, **FCCSS** will return one set of County-approved fabrication and erection documents for use on the job site. County-approved documents shall be used by the **SIER** to conduct special inspections during construction.

- **Construction bracing.** Construction bracing designs shall comply with VOSHA

requirements and shall be submitted to **FCCSS** for review and approval. Construction bracing designs shall include consideration of wind forces, workmen and materials loadings, and anchorage. Construction bracing designs for walls greater than 12'-0" in height (3658 mm) shall be prepared, signed and sealed by **RDPs**.

SIFC-1003 SPECIAL INSPECTIONS

The **SIER** shall perform special inspections of masonry construction, including construction bracing, for conformance with County-approved documents and in accordance with IBC-1704.5, IBC-Table 1704.5.1, and IBC-Table 1704.5.3, depending upon the classification of the building or structure as an "essential" or "nonessential" facility and the type of masonry design as "empirical" or "engineered" masonry. (An "essential" facility usually means occupancy for disaster prevention or response, and "engineered" masonry usually means structural loadbearing masonry.)

IBC-1704.5 Masonry construction. Masonry construction shall be inspected and evaluated in accordance with the requirements of this section, depending on the classification of the building or structure or nature of occupancy, as defined by this code (see Tables 1604.5 and 1617.6).

Exception: Special inspections shall not be required for:

1. Empirically designed masonry, glass unit masonry, or masonry veneer designed by Section 2109, 2110, or ACI 530/ASCE 5/TMS 402 Chapters 5, 6 or 7 when they are part of nonessential buildings (see Tables 1604.5 and 1617.6).
2. Masonry foundation walls constructed in accordance with Table 1805.5(1), 1805.5(2), 1805.5(3) or 1805.5(4).

IBC-1704.5.1 Empirically designed masonry, glass unit masonry and masonry veneer in essential facilities. The minimum inspection program for masonry designed by Chapter 14, Section 2109 or 2110, or by Chapter 5, 6 or 7 of ACI 530/ASCE 5/TMS 402, in essential facilities (see Table 1604.5 and Section 1616.2) shall comply with Table 1704.5.1.

IBC-1704.5.2 Engineered masonry in nonessential facilities. The minimum special inspection program for masonry designed by Section 2106, 2107 or 2108, or by chapters other than Chapters 5, 6, or 7 of ACI 530/ASCE5/TMS 402, in nonessential facilities (see Table 1604.5 and Section 1616.2) shall comply with Table 1704.5.1.

IBC-1704.5.3 Engineered masonry in essential facilities. The minimum special inspection program for masonry designed by Section 2106, 2107 or 2108, or by chapters other than Chapters 5, 6 or 7 of ACI 530/ASCE5/TMS 402, in essential facilities (see Tables 1604.5 and 1617.6) shall comply with Table 1704.5.3.

**IBC-TABLE 1704.5.1
LEVEL 1 SPECIAL INSPECTION**

INSPECTION TASK	FREQUENCY OF INSPECTION		REFERENCE FOR CRITERIA		
	Continuous during task listed	Periodically during task listed	IBC section	ACI 530 / ASCE 5 / TMS 402 ^a	ACI 530.1 / ASCE 6 / TMS 602 ^a
1. As masonry construction begins, the following shall be verified to ensure compliance:					
a. Proportions of site prepared mortar.	—	X	—	—	Art. 2.6A
b. Construction of mortar joints.		X			Art. 3.3B
c. Location of reinforcement and connectors.		X			Art. 3.4
2. The inspection program shall verify:					
a. Size and location of structural elements.		X			3.3G
b. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction.		X		Sec. 1.15.4, 2.1.2	
c. Specified size, grade and type of reinforcement.		X		Sec. 1.12	Art. 2.4, 3.4
d. Welding of reinforcing bars.	X		Sec. 2108.9.2.11 Item 2	Sec. 2.1.8.6, 2.1.8.6.2	
e. Protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F).		X	Sec. 2104.3, 2104.4		Art. 1.8
3. Prior to grouting, the following shall be verified to ensure compliance:					
a. Grout space is clean.		X			Art. 3.2D
b. Placement of reinforcement and connectors.	—	X	—	Sec. 1.12	Art. 3.4
c. Proportions of site-prepared grout.		X			Art. 2.6B
d. Construction of mortar joints.		X			Art. 3.3B
4. Grout placement shall be verified to ensure compliance with code and construction document provisions.	X	—	—	—	Art. 3.5
5. Preparation of any required grout specimens, mortar specimens and/or prisms shall be observed.	X	—	Sec. 2105.3, 2105.4, 2105.5	—	Art. 1.4
6. Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified.	—	X	—	—	Art. 1.5

For SI: °C = (°F - 32)/1.8.

a. The specific standards referenced are those listed in Chapter 35.

**IBC-TABLE 1704.5.3
LEVEL 2 SPECIAL INSPECTION**

INSPECTION TASK	FREQUENCY OF INSPECTION		REFERENCE FOR CRITERIA		
	Continuous during task listed	Periodically during task listed	IBC section	ACI 530/ASCE 5/TMS 402 ^a	ACI 530.1/ASCE 6/TMS 602 ^a
1. From the beginning of masonry construction, the following shall be verified to ensure compliance:					
a. Proportions of site-mixed mortar and grout.		X			Art. 2.6A
b. Placement of masonry units and construction of mortar joints.		X	—		Art. 3.3B
c. Placement of reinforcement and connectors.		X		Sec. 1.12.3	Art. 3.4
d. Grout space prior to grouting.	X				Art. 3.2D
e. Placement of grout.	X				Art. 3.5
2. The inspection program shall verify:					
a. Size and location of structural elements.		X			3.3G
b. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction.	X			Sec. 1.15.4, 2.1.2	
c. Specified size, grade and type of reinforcement.		X		Sec. 1.12	Art. 2.4, 3.4
d. Welding of reinforcing bars.	X		Sec. 2108.9.2.11 Item 2	Sec. 2.1.8.6, 2.1.8.6.2	
e. Protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F).		X	Sec. 2104.3, 2104.4		Art. 1.8
3. Preparation of any required grout specimens, mortar specimens and/or prisms shall be observed.	X	—	Sec. 2105.3, 2105.4, 2105.5	—	Art. 1.4
4. Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified.	—	X	—	—	Art. 1.5

For SI: °C = (°F - 32)/1.8.

a. The specific standards referenced are those listed in Chapter 35.

SIFC-1004 COLD-WEATHER AND HOT-WEATHER CONSTRUCTION

SIFC-1004.1 Cold weather. When either the ambient temperature falls below 40°F (4°C), or the temperature of masonry units is below 40°F (4°C), cold weather construction requirements as specified in IBC-Table 1704.5.1 or IBC-Table 1704.5.3 and IBC-2104.3 shall be implemented.

IBC-2104.3 Cold-weather construction. The following cold-weather procedures shall be implemented when either the ambient temperature falls below 40°F (4°C) or the temperature of masonry units is below 40°F (4°C):

1. Temperatures of masonry units shall not be less than 20°F (-7°C) when laid in the masonry. Visible ice on masonry units shall be removed before the unit is laid in the masonry.
2. Mortar sand or mixing water shall be heated to produce mortar temperatures between 40°F (4°C) and 120°F (49°C) at the time of mixing. Mortar shall be maintained above freezing until used in masonry.
3. Heat sources shall be used where ambient temperatures are between 20°F (-7°C) and 25°F (-4°C) on both sides of the masonry under construction and wind breaks shall be installed when wind velocity is in excess of 15 mph (24 km/hr).
4. Where ambient temperatures are below 20°F (-7°C), an enclosure for the masonry under construction shall be provided and heat sources shall be used to maintain temperatures above 32°F (0°C) within the enclosure.
5. Where mean daily temperatures are between 32°F (0°C) and 40°F (4°C), completed masonry shall be protected from rain or snow by covering with a weather-resistant membrane for 24 hours after construction.
6. Where mean daily temperatures are between 25°F (-4°C) and 32°F (0°C), completed masonry shall be completely covered with a weather-resistant membrane for 24 hours after construction.
7. Where mean daily temperatures are between 20°F (-7°C) and 25°F (-4°C), completed masonry shall be completely covered with insulating blankets or equal protection for 24 hours after construction.
8. Where mean daily temperatures are below 20°F (-7°C), masonry temperature shall be maintained above 32°F (0°C) for 24 hours after construction by enclosure with supplementary heat, by electric heating blankets, by infrared heat lamps or by other approved methods.
9. Glass unit masonry shall not be laid during cold periods as defined in this section. The temperature of glass unit masonry shall be maintained above 40°F (4°C) for the first 48 hours after construction.

SIFC-1004.2 Hot weather. When either the ambient temperature equals or exceeds 100°F (38°C), or the ambient temperature equals or exceeds 90°F (32°C) with a wind velocity greater than 8 mph (13 km/h), hot weather construction requirements as specified in IBC-Table 1704.5.1 or IBC-Table 1704.5.3 and IBC-2104.4 shall be implemented.

IBC-2104.4 Hot weather construction. The following hot-weather procedures shall be implemented when the temperature or the temperature and wind-velocity limits of this section are exceeded.

IBC-2104.4.1 Preparation. The following requirements shall be met prior to conducting masonry work.

IBC-2104.4.1.1. Temperature. When the ambient temperature exceeds 100°F (38°C), or exceeds 90°F (32°C) with a wind velocity greater than 8 mph (13 km/h):

1. Necessary conditions and equipment shall be provided to produce mortar having a temperature below 120°F (49°C).
2. Sand piles shall be maintained in a damp, loose condition.

IBC-2104.4.1.2. Special conditions. When the ambient temperature exceeds 115°F (46°C), or 105°F (40°C) with a wind velocity greater than 8 mph (13 km/h), the requirements of Section 2104.4.1.1 shall be implemented, and materials and mixing

equipment shall be shaded from direct sunlight.

IBC-2104.4.2 Construction. The following requirements shall be met while masonry work is in progress.

IBC-2104.4.2.1. Temperature. When the ambient temperature exceeds 100°F (38°C), or exceeds 90°F (32°C) with a wind velocity greater than 8 mph (13 km/h):

1. The temperature of mortar and grout shall be maintained below 120°F (49°C).
2. Mixers, mortar transport containers and mortar boards shall be flushed with cool water before they come into contact with mortar ingredients or mortar.
3. Mortar consistency shall be maintained by retempering with cool water.
4. Mortar shall be used within 2 hours of initial mixing.

IBC-2104.4.2.2. Special conditions. When the ambient temperature exceeds 115°F (46°C), or exceeds 105°F (40°C) with a wind velocity greater than 8 mph (13 km/h), the requirements of Section 2104.4.2.1 shall be implemented and cool mixing water shall be used for mortar and grout. The use of ice shall be permitted in the mixing water prior to use. Ice shall not be permitted in the mixing water when added to the other mortar or grout materials.

IBC-2104.4.3 Protection. When the mean daily temperature exceeds 100°F (38°C), or exceeds 90°F (32°C) with a wind velocity greater than 8 mph (13 km/h), newly constructed masonry shall be fog sprayed until damp at least three times a day until the masonry is three days old.

SIFC-1004.3 Temperature records. The **SIER** shall maintain and submit temperature records with daily inspection reports.

SIFC-1005 COMPLETION OF MASONRY CONSTRUCTION

Upon completion of masonry special inspections, the **SIER** shall, after review and approval by the **SER**, submit a completion letter to **FCCSS** and shall indicate the date of completion on the final report of special inspections.

CHAPTER 11 SOILS AND FOUNDATIONS

SIFC-1101 GENERAL

SIFC-1101.1 Scope. The requirements of this chapter and IBC-1704.7, IBC-1704.8, and IBC-1704.9 shall apply when construction includes soil-related conditions or foundation systems as listed in SIFC-302.7.

SIFC-1101.2 Soils report. The soils report as required by IBC-1802.2 and IBC-1802.6 shall be prepared, signed and sealed by the **GER** and shall be submitted to the **EFRD** for review and approval prior to permit issuance. The County-approved soils report, County-approved construction documents and County-approved fabrication and erection documents shall be used by the **SIER** to conduct special inspections during construction.

SIFC-1102 FABRICATION AND ERECTION DOCUMENTS

SIFC-1102.1 Review and approval. The soils and foundations fabrication and erection documents shall be submitted to the **GER**, **SER** and **FCCSS** for review and approval prior to construction, as appropriate. The **GC** shall submit two sets of **GER/SER**-approved fabrication and erection documents to **FCCSS** for approval. After approval, **FCCSS** will return one set of County-approved fabrication and erection documents for use on the job site. County-approved documents shall be used by the **SIER** to conduct special inspections during construction.

SIFC-1102.2 Preparation of fabrication and erection documents. A **RDP** with experience in the design of deep foundation elements shall prepare, sign and seal fabrication and erection documents for pile and pier foundations. The fabrication and erection documents for cast-in-place concrete shallow foundations shall be prepared as required in SIFC-2000 Chapter 7.

SIFC-1103 SOILS-RELATED DEVIATIONS AND REVISIONS

SIFC-1103.1 Review and approval. Revisions to the County-approved soils report and/or the County-approved construction documents and County-approved fabrication and erection documents shall bear the seal and signature of the appropriate **RDPs** and shall be submitted to the **EFRD**, the **BPRD** and/or **FCCSS**, as appropriate, for review and approval prior to continuation of construction. The **FCCSS** Inspector shall determine if the construction can proceed pending approvals by the **EFRD** and/or the **BPRD**.

SIFC-1103.2 Preparation of revisions. The **GER** shall prepare, sign and seal revisions to the County-approved soils report if on-site soil and/or ground water conditions vary materially from those presumed to exist based on the initial subsurface exploration and as indicated in the County-approved soils report. The **GER** shall coordinate revisions to the County-approved construction documents and/or County-approved fabrication and erection documents with the **SER** responsible for structural design of foundations and the **RDP** responsible for deep foundations, if applicable. The **SER** and/or the **RDP** responsible for deep foundations, if applicable, shall prepare, sign and seal revisions to the County-approved construction documents and County-approved fabrication and erection documents.

SIFC-1104 SPECIAL INSPECTIONS

SIFC-1104.1 Soils. Special inspections as specified in the County-approved Statement of Special Inspections shall be conducted to determine compliance with the County-approved soils report and the County-approved construction documents. The **GER** shall perform special inspections of soils in accordance with IBC-1704.7 and IBC-1803. Special inspections shall include:

- a. Subgrade.** Subgrade for compatibility of bearing material and ground water conditions with the County-approved soils report, prior to construction of footings and slabs.
- b. Fill material.** Fill material for compliance with County-approved structural fill specifications, prior to, during, and following its placement in each lift, for structural fill 12 inches (305 mm) or greater in total depth.
- c. Compaction.** Compaction process to determine that materials' quality and in-place density tests comply with the County-approved specifications and geotechnical notes.

IBC-1704.7 Soils. The special inspections for existing site soil conditions, fill placement and load-bearing requirements shall follow Sections 1704.7.1 through 1704.7.3. The approved soils report, required by Section 1802.2, shall be used to determine compliance.

Exception: Special inspections not required during placement of fill less than 12 inches (305 mm) deep.

IBC-1704.7.1 Site preparation. Prior to placement of the prepared fill, the special inspector shall determine that the site has been prepared in accordance with the approved soils report.

IBC-1704.7.2 During fill placement. During placement and compaction of the fill material, the special inspector shall determine that the material being used and the maximum lift thickness comply with the approved report, as specified in Section 1803.4.

IBC-1704.7.3 Evaluation of in-place density. The special inspector shall determine, at the approved frequency, that the in-place dry density of the compacted fill complies with the approved report.

SIFC-1104.2 Deep foundations. The **GER** shall perform special inspections of deep foundations to determine their in-place loadbearing capacity.

IBC-1704.8 Pile foundations. A special inspector shall be present when pile foundations are being installed and during tests. The special inspector shall make and submit to the building official records of the installation of each pile and results of load tests. Records shall include the cutoff and tip elevation of each pile relative to a permanent reference.

IBC-1704.9 Pier foundations. Special inspection is required for pier foundations for buildings assigned to Seismic Design Category C, D, E or F in accordance with Section 1616.3.

Special inspections shall include:

- a. **Piling.** Special inspections as required by IBC-1704.8 and IBC-1807, IBC-1808, IBC-1809, IBC-1810, or IBC-1811 as appropriate, and shall include inspection of piles before, during, and after driving. Inspection reports shall contain an evaluation of the pile capacity based on driving resistance, and dynamic or static pile testing. Pile driving records shall be submitted to **FCCSS** prior to placement of pile caps.
- b. **Piers.** Special inspections as required by IBC-1704.9 and IBC-1807, IBC-1808, IBC-1809, IBC-1810, or IBC-1811 as appropriate, and shall include concrete strength, steel reinforcement, orientation and shape of caissons, and bearing capacity at the base of the caisson. Inspection reports shall be submitted to **FCCSS** prior to the placement of grade beams.

SIFC-1104.3 Shallow footings and foundations. The **SIER** or **GER** shall perform structural inspections of footings and foundation systems, including shallow foundations, foundation walls, mats, slabs, etc., as specified in the County-approved Statement of Special Inspections. Special inspections of cast-in-place concrete shall be performed in accordance with SIFC-2000 Chapter 7, to include monitoring the placement of concrete, concrete reinforcement, and the dimensions, shapes and locations of footings, slabs, and foundation walls.

SIFC-1104.4 Revisions and deviations. In the event that field conditions vary materially from the County-approved soils report and the County-approved construction documents, the **SIER** or **GER** shall notify the **GC** and the requirements of SIFC-1103 shall apply.

SIFC-1105 COMPLETION OF SOILS AND FOUNDATIONS CONSTRUCTION

SIFC-1105.1 Soils. Upon completion of soil-related special inspections, the **GER** shall, after review and approval by the **SER** as applicable, submit a completion letter to **FCCSS** and shall indicate the date of completion on the final report of special inspections.

SIFC-1105.2 Deep foundations. Upon completion of all piling and caisson deep foundations, the **GER** shall, after review and approval by the **SER** as applicable, submit a completion letter to **FCCSS** and shall indicate the date of completion on the final report of special inspections.

SIFC-1105.3 Shallow footings and foundations. Upon completion of structural special inspections of footings and foundations, the **SIER** or **GER** as applicable shall, after review and approval by the **SER** and/or **GER** as applicable, submit a completion letter to **FCCSS** and shall indicate the date of completion on the final report of special inspections.

CHAPTER 12 EARTH RETENTION SYSTEMS

SIFC-1201 GENERAL

The requirements of this chapter shall apply when construction includes earth retention systems elements as listed in SIFC-302.8.

SIFC-1202 CONSTRUCTION DOCUMENTS

SIFC-1202.1 Review and approval. The earth retention system construction documents shall be submitted for review and approval to the **BPRD** prior to permit issuance. Construction documents for earth retention systems which are to become a permanent part of the final structure shall be reviewed and approved by the **SER**, including field inspection requirements, prior to submission to the **BPRD**.

SIFC-1202.2 Preparation of construction documents. Earth retention system construction documents, including the related design calculations, shall be prepared, signed and sealed by a **RDP** experienced in the design of earth retention systems. In addition to structural design, the construction documents shall include the following:

- **Adjoining properties.** Recommendations for protecting adjoining properties, including existing public and private streets.
- **Slope protection.** Specification of responsibility for protecting all slopes in accordance with general practice, throughout the course of the project.
- **Dewatering.** Any requirements for dewatering of the excavation that are specified or assumed in the earth retention system design.
- **Installation.** System installation criteria, including allowable inward movement, pile installation and tie-back criteria, and requirements for inspection and monitoring of the earth retention system construction and adjacent properties.

SIFC-1203 FABRICATION AND ERECTION DOCUMENTS

SIFC-1203.1 Review and approval. The earth retention system fabrication and erection documents shall be submitted to the **SER** and **FCCSS** for review and approval prior to construction. The **GC** shall submit two sets of **SER**-approved fabrication and erection documents to **FCCSS** for approval. After County review and approval, **FCCSS** will return one set of County-approved fabrication and erection documents for use on the job site. County-approved documents shall be used by the **SIER** to conduct special inspections during construction.

SIFC-1203.2 Preparation of fabrication and erection documents. The **RDP** responsible for the construction documents shall also prepare, sign and seal the fabrication and erection documents.

SIFC-1204 INSPECTIONS

SIFC-1204.1 Special inspections required. In problem soils areas, as defined by the Fairfax County Public Facilities Manual, the **GER** shall perform the special inspections of the earth retention system. In non-problem soils areas, the **GER** or the **SIER** shall perform the special inspections. Earth retention systems shall have special inspections performed to determine compliance with County-approved construction documents and this SIFC-2000, including the following:

- **Compaction.** Compaction process to determine that materials' quality and in-place density tests comply with the County-approved specifications and geotechnical notes and the requirements of IBC-1704.7.
- **Backfill, drainage and waterproofing.** Backfill, foundation drainage systems, and waterproofing during and following their placement for compliance with County-approved backfill, foundation drainage systems, and waterproofing specifications.

SIFC-1204.2 Inspection reports. Inspection reports shall be submitted to the appropriate **RDPS** of record and **FCCSS**.

SIFC-1204.3 Deviations. Deviations from the County-approved earth retention system construction documents shall be subject to approval by the appropriate **RDP** of record and the **BPRD** and **FCCSS** prior to work continuing in the affected area. When the earth retention system is to become a permanent part of the final structure, deviations shall also be subject to approval by the **SER**.

SIFC-1205 COMPLETION OF EARTH RETENTION SYSTEM CONSTRUCTION

At the completion of the earth retention system construction, the **SIER** shall, after review and approval by the appropriate **RDPS**, submit a completion letter to **FCCSS**, and shall indicate the date of completion on the final report of special inspections. When the earth retention system is to become a permanent part of the final structure, the **SER** shall review and approve the completion letter prior to submission to **FCCSS**, with approval indicating that the system is acceptable as a structural element of the final structure.

CHAPTER 13 EXTERIOR INSULATION AND FINISH SYSTEMS

SIFC-1301 GENERAL

SIFC-1301.1 Scope. The requirements of this chapter and IBC-1704.12 shall apply when construction includes exterior insulation and finish systems (EIFS) elements as listed in SIFC-302.9.

IBC-1704.12 Exterior insulation and finish systems (EIFS). Special inspections shall be required for all EIFS applications.

Exceptions:

1. Special inspections shall not be required for EIFS applications installed over a water-resistive barrier with a means of draining moisture to the exterior.
2. Special inspections shall not be required for EIFS applications installed over masonry or concrete walls.

SIFC-1302 CONSTRUCTION DOCUMENTS

SIFC-1302.1 Review and approval. The construction documents required to be submitted to the **BPRD** for review and approval prior to permit issuance shall include EIFS information and details as required by SIFC-1302.2. After approval, the **BPRD** will return one set of County-approved construction documents for use on the job site.

SIFC-1302.2 Preparation of construction documents. Construction documents for the EIFS, including the related design calculations, shall be prepared, signed and sealed by a **RDP**. The construction documents shall include, but not be limited to, the following information and details:

- Copy of EIFS research report.
- Design wind pressure on the EIFS and related calculations.
- Waterproofing and drainage provisions including weepholes and any limitations on EIFS or building materials, especially substrate and building framing, for prevention of moisture infiltration to building sheathing or framing.
- EIFS material types and thicknesses, including flame spread and smoke development ratings.
- Details consistent with intent of the research report and manufacturer's instructions for method of installation at all openings, corners and panel terminations.
- Location and configuration of control joints, weepholes, and flashing.
- Typical cross-sectional configuration showing all components of the wall. All building sheathing and framing materials in contact with the EIFS shall be dampproofed in accordance with IBC-1806. Wood shall also be naturally durable or preservative-treated in accordance with IBC-2303.1.8.
- Typical wall configuration showing details of system penetrations.
- System installation criteria, including ambient temperature limitations.

SIFC-1303 FABRICATION AND ERECTION DOCUMENTS

SIFC-1303.1 Review and approval. The **GC** shall submit two sets of EIFS fabrication and erection documents to **FCCSS** for review and approval prior to EIFS elements' fabrication, erection or application, as appropriate. The **AR** and the **SER** shall review and approve the fabrication and erection documents for compliance with the architectural and structural design of the building and the County-approved construction documents prior to submission to **FCCSS**. After approval, **FCCSS** will return one set of County-approved fabrication and erection documents for use on the job site.

SIFC-1303.2 Preparation of fabrication and erection documents. The **RDP** responsible for preparation of the EIFS construction documents shall also prepare, sign and seal the EIFS fabrication and erection documents. Information shall include, but not be limited to:

- Reference to research report number and identification of EIFS manufacturer.
- For prefabricated panels or elements, complete fabrication and erection details, including element fabrication, storage and transportation instructions, rigging requirements, and erection bracing.
- EIFS manufacturer installation and application instructions.
- Layout and details for application of insulation boards.
- Details for control joints, flashing, weepholes, sealants and caulking.
- System installation criteria, including ambient temperature limitations.
- Criteria and timing for special inspections during construction.

SIFC-1304 INSPECTION OF EIFS FABRICATORS

Where fabrication of EIFS panels or elements is being performed off-site on the premises of a fabricator's shop, the **SIER** shall verify that the EIFS plant has a documented and implemented Quality Control Program and shall notify **FCCSS** in writing of his/her findings. The **SIER** may inspect the EIFS plant at appropriate intervals to verify that materials, methods, products, and quality control comply with project specifications and County-approved documents. Prefabricated EIFS panels and elements shall be subject to special inspections during fabrication.

SIFC-1305 INSPECTION OF EIFS ELEMENTS

EIFS installation shall be performed by trained applicators. All EIFS elements shall be subject to special inspections during erection and application. The **SIER** shall perform special inspections of EIFS building elements as required by the VUSBC and IBC-1704.12 during erection for conformance with County-approved documents, including the information required by SIFC-1302.2 and SIFC-1303.2.

SIFC-1306 COMPLETION OF EIFS CONSTRUCTION

Upon completion of EIFS construction, the **SIER** shall, after review and approval by the **AR** and **SER**, submit a completion letter to **FCCSS** and shall indicate the date of completion on the final report of special inspections.

CHAPTER 14 SPRAYED FIRE-RESISTANT MATERIALS

SIFC-1401 GENERAL

SIFC-1401.1 Scope. The requirements of this chapter and IBC-1704.11 shall apply for all sprayed fire-resistant materials used to provide required fire resistance ratings for structural elements and decks. Sprayed fire-resistant materials shall not be applied to building elements until required inspections of the building elements and connections have been conducted and approved. Sprayed fire-resistant materials shall be applied, inspected and approved before attachment of, or concealment by, other elements of the building.

The **SIER** shall inspect and test sprayed fire-resistant materials, including preparation of structural member surfaces, verification of substrate ambient temperatures and ventilation requirements, and testing samples for thickness, density and adhesion.

SIFC-1402 DESIGN DOCUMENTS

SIFC-1402.1 Construction documents. Designs for sprayed fire-resistant materials shall be listed by UL to provide the required fire-resistance rating for structural elements and decks. Structural elements shall be classified as thermally unrestrained in accordance with the UL Fire Resistance Directory unless written certification by the **SER** is provided to **FCCSS** that the assembly meets UL restrained criteria. The fire-resistance designs shall be designated on the County-approved construction documents. Copies of the UL listings shall be provided in the field for use by the **SIER**.

SIFC-1402.2 Fabrication and erection documents. The sprayed fire-resistant material manufacturer's installation requirements and details, including specific UL listing information, shall be included on the fabrication and erection documents. Non-standard fire-resistance design features such as adhesives, overcoats, metal lath/netting, etc., shall be specifically detailed. Clips, standoffs or other devices necessary for attachment of other elements of the building shall be specifically detailed.

SIFC-1402.3 Review and approval. The fabrication and erection documents shall be reviewed and approved by the **AR** and **SER**. The **GC** shall submit two sets of **AR/SER**-approved fabrication and erection documents to **FCCSS** for approval. After approval, **FCCSS** will return one set of County-approved documents, for **SIER** use on the job site to conduct inspections.

SIFC-1403 INSPECTION AND TESTING

SIFC-1403.1 Inspections and tests. The **SIER** shall inspect and test sprayed fire-resistant materials to verify compliance with IBC-1704.11 and the following:

SIFC-1403.1.1 Building elements and connections. In addition to other required inspections of the building elements and connections, inspections shall include any non-standard design features or devices as shown on the County-approved fabrication and erection documents for sprayed fire-resistant materials (see SIFC-1402.2). Other building

elements such as pre-cast concrete spandrel panels, electrical conduits, mechanical ductwork or metal studs shall not be installed that interfere with the application of sprayed fire-resistant materials.

SIFC-1403.1.2 Application. Sprayed fire-resistant materials shall not be applied to building elements until required inspections of the building elements and connections have been conducted and approved. The sprayed fire-resistant materials shall be applied to all surfaces and lengths of members such that the continuity of fire-resistance required by the County-approved fire-resistive designs is obtained.

SIFC-1403.1.3 Sampling and testing.

SIFC-1403.1.3.1 Thickness and density. Sampling and testing shall be in accordance with IBC-1704.11.3 and IBC-1704.11.4 and ASTM E 605, at least once for each 1,000 square feet (93 m²) of sprayed area for floors, roofs and walls and 25 per cent of the structural members on each floor.

SIFC-1403.1.3.2 Adhesion. Sampling and testing shall be in accordance with IBC-1704.11.5 and ASTM E 736, at least once for each 10,000 square feet (929 m²) of sprayed area for floors, roofs and walls and one of each type of structural member per 10,000 square feet (929 m²) on each floor.

SIFC-1403.1.4 Attachment of other elements. Sprayed fire-resistant materials shall be inspected and approved before attachment of other elements of the building. Sprayed fire-resistant materials shall not be scraped off or removed to attach other building elements. Prior to concealment, sprayed fire-resistant materials shall be inspected and approved after attachment of other elements of the building. Any sprayed fire-resistant material damaged, scraped off, or removed shall be repaired.

IBC-1704.11 Sprayed fire-resistant materials. Special inspections for sprayed fire-resistant materials applied to structural elements and decks shall be in accordance with Sections 1704.11.1 through 1704.11.5. Special inspections shall be based on the fire-resistance design as designated in the approved construction documents.

IBC-1704.11.1 Structural member surface conditions. The surfaces shall be prepared in accordance with the approved fire-resistance design and the approved manufacturer's written instructions. The prepared surface of structural members to be sprayed shall be inspected before the application of the sprayed fire-resistant material.

IBC-1704.11.2 Application. The substrate shall have a minimum ambient temperature before and after application as specified in the approved manufacturer's written instructions. The area for application shall be ventilated during and after application as required by the approved manufacturer's written instructions.

IBC-1704.11.3 Thickness. The average thickness of the sprayed fire-resistant materials applied to structural elements shall not be less than the thickness required by the approved fire-resistance design. Individual measured thickness, which exceeds the thickness specified in a design by $\frac{1}{4}$ inch (6.4 mm) or more shall be recorded as the thickness specified in the design plus $\frac{1}{4}$ inch (6.4 mm). For design thicknesses 1 inch (25 mm) or greater, the minimum allowable individual thickness shall be the design thickness minus $\frac{1}{4}$ inch (6.4 mm). For design thicknesses less than 1 inch (25 mm), the minimum allowable individual thickness shall be the design thickness minus 25 percent. Thickness shall be determined in accordance with ASTM E 605. Samples of the sprayed fire-resistant materials shall be selected in accordance with Sections 1704.11.3.1 and 1704.11.3.2.

IBC-1704.11.3.1 Floor, roof and wall assemblies. The thickness of the sprayed fire-resistant material applied to floor, roof and wall assemblies shall be determined in accordance with ASTM E 605, taking the average of not less than four measurements for each 1,000 square feet (93 m²) of the sprayed area on each floor or part thereof.

IBC-1704.11.3.2 Structural framing members. The thickness of the sprayed fire-resistant material applied to structural members shall be determined in accordance with ASTM E 605. Thickness testing shall be performed on not less than 25 percent of the structural members on each floor.

IBC-1704.11.4 Density. The density of the sprayed fire-resistant material shall not be less than the density specified in the approved fire-resistant design. Density of the sprayed fire-resistant material shall be determined in accordance with ASTM E 605.

IBC-1704.11.5 Bond strength. The cohesive/adhesive bond strength of the cured sprayed fire-resistant material applied to structural elements shall not be less than 150 pounds per square foot (7.18 kN/m²). The cohesive/adhesive bond strength shall be determined in accordance with the field test specified in ASTM E 736 by testing in-place samples of the sprayed fire-resistant material selected in accordance with Sections 1704.11.5.1 and 1704.11.5.2.

IBC-1704.11.5.1 Floor, roof and wall assemblies. The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from each floor, roof and wall assembly at the rate of not less than one sample for every 10,000 square feet (929 m²) or part thereof of the sprayed area in each story.

IBC-1704.11.5.2 Structural framing members. The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from beams, girders, joists, trusses and columns at the rate of not less than one sample for each type of structural framing member for each 10,000 square feet (929 m²) of floor area or part thereof in each story.

SIFC-1404 COMPLETION OF SPRAYED FIRE-RESISTANT MATERIALS

Upon completion of sprayed fire-resistant material construction, the **SIER** shall, after review and approval by the **AR** and **SER**, submit a completion letter to **FCCSS** and shall indicate the date of completion on the final report of special inspections.

CHAPTER 15 SMOKE CONTROL SYSTEMS

SIFC-1501 GENERAL

SIFC-1501.1 Scope. The requirements of this chapter and IBC-1704.14 shall apply for all smoke control systems.

IBC-1704.14 Special inspection for smoke control. Smoke control systems shall be tested by a special inspector.

IBC-1704.14.1 Testing scope. The test scope shall be as follows:

1. During erection of ductwork and prior to concealment for the purposes of leakage testing and recording of device location.
2. Prior to occupancy and after sufficient completion for the purposes of pressure difference testing, flow measurements, and detection and control verification.

SIFC-1501.2 Special inspectors. Special inspections and tests for smoke control systems shall be conducted by qualified individuals, agencies or firms approved by the **Fire Protection Systems Testing Section**, Fire Prevention Division of the Fire and Rescue Department on behalf of the building official. The **SIER** for smoke control systems might be different from the **SIER** for other special inspections.

IBC-1704.14.2 Qualifications. Special inspection agencies for smoke control shall have expertise in fire-protection engineering, mechanical engineering and certification as air balancers.

SIFC-1501.3 Inspections. Special inspections for smoke control systems shall assess, document and verify the following systems/elements:

- automatic dampers
- control air tubing/DDC wiring
- control diagrams and sequences
- fan belts
- exhaust fan components
- power: normal and standby

SIFC-1501.4 Tests. Tests shall document and verify the adequate performance of:

- control elements and sequences
- control air tubing/ DDC wiring
- control devices
- dampers
- detection devices and their tolerances
- doors
- ducts and shafts
- fans
- inlets and outlets, including sizes and positions

SPECIAL INSPECTIONS: Implementation in Fairfax County (2000)

- pressurized stair enclosures
- smoke zone or area boundary elements/ barriers
- response times
- leakage of boundary or barrier elements, including doors and partitions.
- power: normal and standby

All tests, including failed tests and subsequent follow-up re-tests and corrective actions, shall be recorded and form part of the final report.

SIFC-1502 COMPLETION OF SMOKE CONTROL SYSTEMS

Final reports shall verify compliance with all portions of IBC-909.18, IBC-909.19 and IBC-909.20, as applicable. Upon completion of smoke control systems, the **SIER** for smoke control systems shall, after review and approval by the **AR** and the **Fire Protection Systems Testing Section**, Fire Prevention Division of the Fire and Rescue Department, submit a completion letter to **FCCSS** and shall indicate the date of completion on the final report of special inspections.

CHAPTER 16 MECHANICAL, ELECTRICAL AND PLUMBING COMPONENTS

SIFC-1601 GENERAL

For “essential facilities” (buildings assigned to Seismic Design Category C, D, E, or F), mechanical, electrical and plumbing components shall have a quality assurance plan, and be specially inspected and tested, in accordance with IBC-1705.1, IBC-1707.1, IBC-1707.7, IBC-1708.2, and IBC-1708.5.

IBC-1705.1 Scope. A quality assurance plan for seismic requirements shall be provided in accordance with Section 1705.2 for the following:

3. The following additional systems in structures assigned to Seismic Design Category C:
 - 3.1. HVAC ductwork containing hazardous materials, and anchorage of such ductwork
 - 3.2. Piping systems and mechanical units containing flammable, combustible or highly toxic materials
 - 3.3. Anchorage of electrical equipment used for emergency or standby power systems.

SIFC-1602 INSPECTIONS AND TESTS

IBC-1707.1 Special inspections for seismic resistance. Special inspection as specified in this section is required for the following, where required in Section 1704.1. Special inspections itemized in Sections 1707.2 through 1707.8 are required for the following:

3. Architectural, mechanical and electrical components in structures assigned to Seismic Design Category C, D, E or F that are required in Sections 1707.6 and 1707.7.

IBC-1707.7 Mechanical and electrical components. Periodic special inspection during the anchorage of electrical equipment for emergency or standby power systems in structures assigned to Seismic Design Category C, D, E or F. Periodic special inspection during the installation of anchorage of other electrical equipment in structures assigned to Seismic Design Category E or F. Periodic special inspection during installation of piping systems intended to carry flammable, combustible, or highly toxic contents and their associated mechanical units in structures assigned to Seismic Design Category C, D, E or F. Periodic special inspection during the installation of HVAC ductwork that will contain hazardous materials in structures assigned to Seismic Design Category C, D, E or F.

IBC-1707.7.1 Component inspection. Special inspection is required for the installation of the following components where the component has a Component Importance Factor of 1.0 or 1.5 in accordance with Section 1621.1.6, shall maintain an approved quality control program. Evidence of the quality control program shall be permanently identified on each piece of equipment by a label.

1. Equipment using combustible energy sources.
2. Electrical motors, transformers, switchgear unit substations and motor control centers.
3. Reciprocating and rotating-type machinery.
4. Piping distribution systems 3 inches (76 mm) and larger.

5. Tanks, heat exchangers and pressure vessels.

IBC-1707.7.2 Component and attachment testing. The component manufacturer shall test or analyze the component and the component mounting system or anchorage for the design forces in Chapter 16 for those components having a Component Importance Factor of 1.0 or 1.5 in accordance with Chapter 16. The manufacturer shall submit a certificate of compliance for review and acceptance by the registered design professional responsible for the design, and for approval by the building official. The basis of certification shall be by test on a shaking table, by three-dimensional shock tests, by an analytical method using dynamic characteristics and forces from Chapter 16 or by more rigorous analysis. The special inspector shall inspect the component and verify that the label, anchorage or mounting conforms to the certificate of compliance.

IBC-1707.7.3 Component manufacturer certification. Each manufacturer of equipment to be placed in a building assigned to Seismic Design Categories E and F, in accordance with Chapter 16, where the equipment has a Component Importance Factor of 1.0 or 1.5 in accordance with Chapter 16, shall maintain an approved quality control program. Evidence of the quality control program shall be permanently identified on each piece of equipment by a label.

IBC-1708.2 Testing for seismic resistance. The tests specified in Sections 1708.3 through 1708.6 are required for the following:

3. Architectural, mechanical and electrical components in structures assigned to Seismic Design Category C, D, E or F that are required in Section 1708.5.

IBC-1708.5 Mechanical and electrical equipment. Each manufacturer of designated seismic system components shall test or analyze the component and its mounting system or anchorage and shall submit a certificate of compliance for review and acceptance by the registered design professional in responsible charge of the design of the designated seismic system and for approval by the building official. The evidence of compliance shall be by actual test on a shake table, by three-dimensional shock tests, by an analytical method using dynamic characteristics and forces, by the use of experience data (i.e., historical data demonstrating acceptable seismic performance), or by more rigorous analysis providing for equivalent safety. The special inspector shall examine the designated seismic system and shall determine whether the anchorages and label conform with the evidence of compliance.

SIFC-1603 COMPLETION OF MECHANICAL, ELECTRICAL AND PLUMBING COMPONENTS

Upon completion, a certificate shall be submitted to FCCSS.

CHAPTER 17 SAFEGUARDS DURING CONSTRUCTION

The requirements of this chapter and IBC Chapter 33 shall apply to all construction sites.

SIFC-1701 PROTECTION OF THE PUBLIC

SIFC-1701.1 Materials and equipment. The **GC** is responsible for safe storage and placement of materials and equipment, as required by IBC-3301.2.

IBC-3301.2 Storage and placement. Construction equipment and materials shall be stored and placed so as not to endanger the public, the workers or adjoining property for the duration of the construction project.

SIFC-1701.2 Occupied buildings. Means of egress from occupied buildings shall be maintained at all times, shall not be blocked, and shall not pass through construction areas. The construction safeguards of IBC-3302 shall also be in effect.

IBC-SECTION 3302 CONSTRUCTION SAFEGUARDS

IBC-3302.1 Remodeling and additions. Required exits, existing structural elements, fire protection devices and sanitary safeguards shall be maintained at all times during remodeling, alterations, repairs or additions to any building or structure.

Exceptions:

1. When such required elements or devices are being remodeled, altered or repaired, adequate substitute provisions shall be made.
2. When the existing building is not occupied.

IBC-3302.2 Manner of removal. Waste materials shall be removed in a manner which prevents injury or damage to persons, adjoining properties and public rights-of-way.

SIFC-1701.3 Fencing, barriers and covered walkways. The **GC** shall install construction site fencing, barriers and covered walkways for protection of the public, in accordance with this section and IBC-3306, prior to the excavation for footings or underground utilities. Impact barricades required for projects located in close proximity to a public use roadway shall be installed according to the Virginia Department of Transportation (VDOT) Road and Bridge Standards. Upon written request by the **GC**, the criteria outlined below may be modified by **FCCSS** when a natural barricade surrounding a construction site exists. The **SIER** shall notify **FCCSS** if protection is not installed.

SIFC-1701.3.1 Site fencing. Every construction operation shall be enclosed with a non-climbable fence not less than six feet high. The **GC** shall have the option of fencing the total perimeter of a construction site or an area within a minimum of twenty feet away from the structure.

SIFC-1701.3.2 Barriers. Barriers shall be of noncombustible or fire-retardant treated

materials and shall comply with IBC-3306.5.

SIFC-1701.3.3 Covered walkways. Covered walkways shall be of noncombustible or fire-retardant treated materials and shall comply with IBC-3306.7.

IBC-SECTION 3306 PROTECTION OF PEDESTRIANS

IBC-3306.1 Protection required. Pedestrians shall be protected during construction, remodeling and demolition activities as required by this Chapter and Table 3306.1. Signs shall be provided to direct pedestrian traffic.

**IBC-TABLE 3306.1
PROTECTION OF PEDESTRIANS**

HEIGHT OF CONSTRUCTION	DISTANCE OF CONSTRUCTION TO LOT LINE	TYPE OF PROTECTION REQUIRED
8 feet or less	Less than 5 feet	Construction railings
	5 feet or more	None
More than 8 feet	Less than 5 feet	Barrier and covered walkway
	5 feet or more, but not more than one-fourth the height of construction	Barrier and covered walkway
	5 feet or more, but between one-fourth and one-half the height of construction	Barrier
	5 feet or more, but exceeding one-half the height of construction	None

For SI: 1 foot = 304.8 mm.

IBC-3306.2 Walkways. A walkway shall be provided for pedestrian travel in front of every construction and demolition site unless the authority having jurisdiction authorizes the sidewalk to be fenced or closed. Walkways shall be of sufficient width to accommodate the pedestrian traffic, but in no case shall they be less than 4 feet (1219 mm) in width. Walkways shall be provided with a durable walking surface. Walkways shall be accessible in accordance with Chapter 11 and shall be designed to support all imposed loads and in no case shall the design live load be less than 150 psf (7.2 kN/m²).

IBC-3306.3 Directional barricades. Pedestrian traffic shall be protected by a directional barricade where the walkway extends into the street. The directional barricade shall be of sufficient size and construction to direct vehicular traffic away from the pedestrian path.

IBC-3306.4 Construction railings. Construction railings shall be at least 42 inches (1067 mm) in height and shall be sufficient to direct pedestrians around construction areas.

IBC-3306.5 Barriers. Barriers shall be a minimum of 8 feet (2438 mm) in height and shall be placed on the side of the walkway nearest the construction. Barriers shall extend the entire length of the construction site. Openings in such barriers shall be protected by doors which are normally kept closed.

IBC-3306.6 Barrier design. Barriers shall be designed to resist loads required in Chapter 16 unless constructed as follows:

1. Barriers shall be provided with 2 x 4 top and bottom plates.

2. The barrier material shall be a minimum of 3/4 inch (19.1 mm) inch boards or 1/4 inch (6.4 mm) wood structural use panels.
3. Wood structural use panels shall be bonded with an adhesive identical to that for exterior wood structural use panels.
4. Wood structural use panels 3/4 inch (6.4 mm) or 5/16 inch (23.8 mm) in thickness shall have studs spaced not more than 2 feet (610 mm) on center.
5. Wood structural use panels 3/4 inch (9.5 mm) or 1/2 inch (12.7 mm) in thickness shall have studs spaced not more than 4 feet (1219 mm) on center, provided a 2 inch by 4 inch (51 mm by 102 mm) stiffener is placed horizontally at the midheight where the stud spacing exceeds 2 feet (610 mm) on center.
6. Wood structural use panels 3/4 inch (15.9 mm) or thicker shall not span over 8 feet (2438 mm).

IBC-3306.7 Covered walkways. Covered walkways shall have a minimum clear height of 8 feet (2438 mm) as measured from the floor surface to the canopy overhead. Adequate lighting shall be provided at all times. Covered walkways shall be designed to support all imposed loads. In no case shall the design live load be less than 150 psf (7.2 kN/m²) for the entire structure.

Exception: Roofs and supporting structures of covered walkways for new, light-frame construction not exceeding two stories in height are permitted to be designed for a live load of 75 psf (3.6kN/m²) or the loads imposed on them, whichever is greater. In lieu of such designs, the roof and supporting structure of a covered walkway is permitted to be constructed as follows:

1. Footings shall be continuous 2 x 6 members.
2. Posts not less than 4 x 6 shall be provided on both sides of the roof and spaced not more than 12 feet (3658 mm) on center.
3. Stringers not less than 4 x 12 shall be placed on edge upon the posts.
4. Joists resting on the stringers shall be at least 2 x 8 and shall be spaced not more than 2 feet (610 mm) on center.
5. The deck shall be planks at least 2 inches (51 mm) thick or wood structural panels with an exterior exposure durability classification at least 23/32 inch (18.3 mm) thick nailed to the joists.
6. Each post shall be knee-braced to joists and stringers by 2 x 4 minimum members 4 feet (1219 mm) long.
7. A 2 x 4 minimum curb shall be set on edge along the outside edge of the deck.

IBC-3306.8 Repair, maintenance and removal. Pedestrian protection required by this chapter shall be maintained in place and kept in good order for the entire length of time pedestrians may be endangered. The owner or the owner's agent, upon the completion of the construction activity, shall immediately remove walkways, debris and other obstructions and leave such public property in as good a condition as it was before such work was commenced.

IBC-3306.9 Adjacent to excavations. Every excavation on a site located 5 feet (1524 mm) or less from the street lot line shall be enclosed with a barrier not less than 6 feet (1829 mm) high. Where located more than 5 feet (1524 mm) from the street lot line, a barrier shall be erected when required by the building official. Barriers shall be of adequate strength to resist wind pressure as specified in Chapter 16.

SIFC-1702 ON-SITE CONCRETE BATCH PLANTS

SIFC-1702.1 Scope. The requirements of this section, ASTM C 94 and ASTM C 685 shall apply whenever a concrete batch plant is erected on-site. Prior to the manufacture of concrete, the **SIER** shall inspect the concrete batch plant site and batch plant and certify in writing to **FCCSS**:

- The scales are accurate.
- The batch plant is capable of producing concrete in compliance with ACI 318 Section 5.8.3, and the batch plant complies with requirements of ASTM C 94 and ASTM C 685.
- Access roads are at least twenty feet wide, located such that delivery trucks will not contaminate stock piles. Mud mats are large enough to prevent stock pile contamination.
- Barricades and warning devices are installed to prevent workers from entering the working radius of the scraper boom. Stock piles are separated by walls having a 45 degree minimum angle from the leading edge of the stock pile, and extending to the outside perimeter of the boom radius.

SIFC-1703 VIRGINIA OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

SIFC-1703.1 General. The **GC** shall ensure that the construction site is safe and in compliance with all applicable VOSHA regulations. A copy of the "Virginia Occupational Safety and Health Standards for the Construction Industry" (29 CFR Part 1926) shall be available on the construction site at all times.

SIFC-1703.2 Masonry walls. Masonry walls shall be braced during their construction (see SIFC-1001.3).

SIFC-1704 TOWER CRANES, PERSONNEL AND MATERIAL HOISTS, CONSTRUCTION ELEVATORS

SIFC-1704.1 General.

a. Scope. The requirements of this section shall apply whenever a tower crane, personnel or material hoist, or construction elevator is to be erected on-site, whether free-standing or attached to the building under construction. Documents shall include the crane / hoist location and crane boom swing. The tower **crane / hoist / elevator supplier** and **GC** are responsible for safe installation and use of the crane / hoist / elevator and construction methods. The **SER** is responsible for the structural design strength of the building to support the loads imposed on it by the crane / hoist / elevator. Crane booms shall not swing over public streets without special approval by **FCCSS**.

b. Permits. A separate building permit is not required for a tower crane, personnel or material hoist / construction elevator and/or its foundation. An electrical permit is required for a tower crane, and both an electrical permit and an elevator (mechanical) permit are required for a personnel or material hoist, or construction elevator.

SIFC-1704.2 Documents.

Construction documents and fabrication and erection documents for the crane / hoist / elevator and its foundation shall be prepared by **RDPs**. Prior to the placement of the crane / hoist / elevator foundation, the **owner / contractor** of the **crane / hoist / elevator**, or the **GC** shall submit one record copy of the following information to **FCCSS**:

a. Crane specifications. Crane specifications including manufacturer's operating model number, hook height, boom length, and manufacturer's specifications relative to overturn moment, slewing moment, vertical load (minimum and maximum), shear per bolt group, uplift per bolt group, compression per corner and horizontal shear (minimum and maximum). Fabrication and erection documents shall include the crane / hoist location and crane boom swing.

b. Personnel and material hoist specifications. Hoist specifications including load lines, load and boom hoist drum brakes, swing brakes and locking devices such as pawls or dogs. The personnel platform shall be designed by the **RDP**. Hoists shall comply with IBC-3005.4.

IBC-3005.4 Personnel and material hoists. Personnel and material hoists shall be designed utilizing an approved method that accounts for the conditions imposed during the intended operation of the hoist device. The design shall include, but is not limited to, anticipated loads, structural stability, impact, vibration, stresses and seismic restraint. The design shall account for the construction, installation, operation and inspection of the hoist tower, car, machinery and control equipment, guide members and hoisting mechanism. Additionally, the design of personnel hoists shall include provisions for field testing and maintenance which will demonstrate that the hoist device functions in accordance with the design. Field tests shall be conducted upon the completion of an installation or following a major alteration of a personnel hoist.

c. Foundations. Fabrication and erection documents shall include structural calculations and design of crane / hoist foundations. Plans and calculations shall clearly indicate footing dimensions, required compressive strength of concrete, steel reinforcement, and allowable soil bearing pressure. The allowable soil bearing pressure shall be consistent with values shown in the soil test report for the project prepared by the **GER**. Concrete mix design, and steel reinforcement, shall be reviewed and approved by the **RDP** responsible for design of crane / hoist foundations.

d. Cranes / hoists / elevators within or attached to the structure. For cranes / hoists / elevators located within or supported by the structure, the fabrication and erection documents shall indicate the size and location of slab openings, method of support or attachment of the crane / hoist / elevator, service loads to be delivered to or imposed on the structure, and the inspections required. Such documents shall be reviewed and approved by the **SER**.

SIFC-1704.3 Inspections.

SIFC-1704.3.1 Foundations. The **SIER** shall conduct foundation inspections in accordance with SIFC-2000 Chapters 7 and 11, with inspection reports to **FCCSS** addressing soil bearing capacity, footing construction, and concrete tests. Upon completion of the foundation the **SIER** shall, after review and approval by the appropriate **RDPs**, submit a completion letter to **FCCSS** and shall indicate the date of completion on the final report of special inspections.

SIFC-1704.3.2 Crane / hoist erection.

- a. Components.** Prior to assembly, the crane / hoist components shall be inspected for structural defects by the **crane / hoist manufacturer** or a **RDP**.
- b. Assembly.** The crane / hoist shall be assembled according to the manufacturer's specifications. All bolts shall be secured in accordance with manufacturer's project specifications, and shall be inspected by the **GC** at erection, thirty days after erection and every ninety days thereafter.

SIFC-1704.3.3 Electrical and mechanical inspection. An inspection by a **Fairfax County**

Electrical Inspector shall be performed and approved. Hoists and construction elevators shall also be inspected and approved by a **Fairfax County Elevator Inspector**.

SIFC-1704.3.4 Completion of crane / hoist installation. The **GC** shall, after review and approval by the appropriate **RDs**, submit a letter of completion of crane / hoist installation to **FCCSS**. **FCCSS** approval is required prior to use of the crane / hoist / elevator.

SIFC-1704.4 Safety rules and regulations.

Virginia Occupational Health and Safety Administration (VOSHA) regulations in Subpart N – Cranes, Derricks, Hoists, Elevators and Conveyors, Section 1926.550 – Cranes and Derricks, Subpart N – Section 1926.552 – Material Hoists, Personnel Hoists and Elevators, and Subpart Q - Section 1926.700 – Concrete and Masonry Construction shall also apply. The **FCCSS** Inspector can require a load test at any time.

SIFC-1705 FIRE PROTECTION

SIFC-1705.1 Fire extinguishers. The **GC** shall be responsible for installing and maintaining portable fire extinguishers during construction as required by IBC-3309.

IBC-SECTION 3309 FIRE EXTINGUISHERS

IBC-3309.1 Where required. All structures under construction, alteration or demolition shall be provided with not less than one approved portable fire extinguisher at each stairway on all floor levels where combustible materials have accumulated. An approved portable fire extinguisher shall be provided in every storage and construction shed. The building official is authorized to require additional approved portable fire extinguishers where special hazards exist, such as flammable or combustible liquid storage hazards. Fire extinguishers shall comply with Section 906.

IBC-3309.2 Fire hazards. The provisions of this code and of the *International Fire Code* shall be strictly observed to safeguard against all fire hazards attendant upon construction operations.

SIFC-1705.2 Standpipes. The **GC** shall be responsible for installing and maintaining standpipes during construction as required by IBC-3311. Standpipes shall be installed during construction as the work of the building progresses, beginning at 40 feet. The standpipe system shall be carried up with each floor and shall be installed and ready for use as each floor progresses. Standpipes shall be extended as construction progresses to within one floor of the highest point of construction having secured decking or flooring. Free access from the street to such standpipes shall be maintained at all times. Materials shall not be stored within 5 feet of any fire hydrant or in the roadway between such hydrant and the center line of the street. Failure to comply with this section shall result in the immediate stop of all work on the project until such time as the standpipes are properly placed.

IBC-SECTION 3311 STANDPIPES

IBC-3311.1 Where required. Buildings four stories or more in height shall be provided with not less than one standpipe for use during construction. Such standpipes shall be installed where the progress of construction is not more than 40 feet (12 192 mm) in height above the lowest level of fire department access. Such standpipe shall be provided with fire department hose connections at accessible locations adjacent to usable stairs. Such standpipes shall be extended as construction progresses to within one floor of the

highest point of construction having secured decking or flooring.

IBC-3311.2 Buildings being demolished. Where a building is being demolished and a standpipe is existing within such a building, such standpipe shall be maintained in an operable condition so as to be available for use by the fire department. Such standpipe shall be demolished with the building but shall not be demolished more than one floor below the floor being demolished.

IBC-3311.3 Detailed requirements. Standpipes shall be installed in accordance with the provisions of Chapter 9.

Exception: Standpipes shall be either temporary or permanent in nature, and with or without a water supply, provided that such standpipes conform to the requirements of Section 905 as to capacity, outlets and materials.

IBC-3311.4 Water supply. Water supply for fire protection, either temporary or permanent shall be made available as soon as combustible material accumulates.

SIFC-1705.3 Fire suppression system. Sprinkler systems shall comply with SIFC-1706.3 and IBC-3312.

SIFC-1706 FIRE PROTECTION AND SAFETY REQUIREMENTS FOR PARTIALLY OCCUPIED BUILDINGS

SIFC-1706.1 General. The existing fire protection, egress paths, and fireresistant construction protection required for occupied areas shall be maintained at all times while ongoing construction in unoccupied areas is in progress.

SIFC-1706.2 Material storage.

- a. Non-combustible storage - area limitations.** Non-combustible materials are those that do not support combustion and are not readily ignitable. Examples of non-combustible materials are: drywall; metal studs, fire retardant lumber; metal doors; solid core wood doors, including packaging aids without voids; sheet metal ducts; masonry; non-combustible insulation; plumbing fixtures; light fixtures wrapped in tight plastic; and other materials of similar characteristics.

Non-combustible storage may be unlimited in area; however, the weight of material stored shall not exceed the structural design capacity of the floor.

- b. Combustible storage - area limitations.** Combustible materials are those that readily support combustion or are readily ignitable. Examples of combustible materials are: hollow core wood doors; wood studs, paneling and other wood products; carpet and padding; vinyl core trim and base; insulation with combustible vapor facing; non-combustible products wrapped in large quantities of combustible packaging or storage aids, and other materials of similar characteristics.

Combustible storage shall be limited to 2,500 cubic feet or 10 percent of the floor area, whichever is smaller; however, the weight of material stored shall not exceed the structural design capacity of the floor. The Owner shall be responsible for obtaining a Fire Prevention Code Permit for combustible storage exceeding these limitations pursuant to the Virginia Statewide Fire Prevention Code. Combustible storage areas located on an occupied floor shall be separated from the occupied areas by one-hour fireresistance rated

fire partitions.

- c. **Storage arrangement.** Storage materials, both combustible and non-combustible, shall be arranged in neat piles with the floor kept broom-clean and free of construction debris. Egress aisles shall be maintained. Storage shall be kept a minimum of two feet below ceilings, sprinkler heads, or the lowest member of the floor-ceiling or roof-ceiling assembly.

SIFC-1706.3 Fire suppression system requirements.

Sprinkler systems shall comply with this section and IBC-3312.

- a. In fully sprinkler-protected buildings, sprinkler protection shall be operational at all times.
- b. Sprinkler heads shall be located within 12 inches of the floor or roof deck above, in either the pendant or upright position. If the ceiling grid is in place, the sprinkler shall be installed in the pendant position.
- c. The use of commercial, rapid or quick response sprinkler heads, located at the future ceiling line without ceiling tiles in place, (except at the sprinkler head location), shall be subject to approval by the Fire Prevention Division.
- d. Where in the opinion of the **FCCSS** Inspector or the Inspector of the Fire Prevention Division, the type or quantity of combustible storage exceeds the limitations of the existing sprinkler system design, the sprinkler system in these areas shall be modified to conform with the fire hazard posed by the combustible storage.
- e. In areas used for non-combustible storage or in unfinished tenant areas, the sprinkler heads may be located at the future level of the suspended ceiling.

IBC-SECTION 3312 AUTOMATIC SPRINKLER SYSTEM

IBC-3312.1 Completion before occupancy. In buildings where an automatic sprinkler system is required by this code, it shall be unlawful to occupy any portion of a building or structure until the automatic sprinkler system installation has been tested and approved, except as provided in Section 110.4.

IBC-3312.2 Operation of valves. Operation of sprinkler control valves shall be permitted only by properly authorized personnel and shall be accompanied by notification of duly designated parties. When the sprinkler protection is being regularly turned off and on to facilitate connection of newly completed segments, the sprinkler control valves shall be checked at the end of each work period to ascertain that protection is in service.

SIFC-1706.4 Special cases. The criteria for fire prevention measures set forth in this section cover the majority of field conditions. It is conceivable that individual situations may arise which shall be evaluated for compliance on a case by case basis.

**SIFC-1707 OCCUPANCY REQUIREMENTS FOR NEW BUILDINGS
AND ALTERATIONS TO EXISTING BUILDINGS**

The requirements of this section shall apply for all non-residential commercial construction projects of all Groups, and for all residential construction projects of Groups R-1 and R-2, pursuant to the Fairfax County Zoning Ordinance (Chapter 112 of the Code of the County of Fairfax).

SIFC-1707.1 Non-Residential Use Permit (Non-RUP).

- a. A certificate of occupancy, also called a Non-RUP, is required prior to use or occupancy of a commercial building (Residential Use Permits (RUPs) are required prior to use or occupancy of a residential building).
- b. A new Non-RUP is required as follows:
 - prior to occupancy of a new building or tenant space; or
 - prior to a change of Group of a building or tenant space; or
 - whenever a building or tenant space has either an increase or decrease in gross floor area; or
 - whenever a building or tenant space has a change in proprietorship.
- c. In other instances of renovations of an existing building, structure or tenant space where such a building, structure or tenant space has a valid certificate of use and occupancy, final inspection approvals serve as the revised certificate of occupancy, and a new Non-RUP is not required.
- d. A "building" is identified by a unique street address. It is the responsibility of the **Owner** to file for and obtain a Non-RUP for a building shell prior to any tenant occupancies. It is the responsibility of building "**tenants**" to file for and obtain a Non-RUP for individual tenant spaces prior to use or occupancy. For purposes of this section, the terms "tenant space," "tenant occupancy," etc., refer to all space and occupancy, whether occupied by a tenant or an owner.

SIFC-1707.2 Non-RUP procedural requirements.**SIFC-1707.2.1 Building shell final inspections.**

A Non-RUP for a building shell may be obtained after final inspections are performed and approved by the following Fairfax County organizations:

- Electrical Inspections Section, Commercial Inspections Division, DPWES.
- Mechanical Inspections Section, Commercial Inspections Division, DPWES.
- Plumbing Inspections Section, Commercial Inspections Division, DPWES.
- Elevator Inspections (Mechanical Inspections Section), Commercial Inspections Division, DPWES.
- Fire Protection Systems Testing Section, Fire Prevention Division of the Fire and Rescue Department.
- Department of Health Services (applicable only to food establishments, medical buildings, health spas, etc.).
- For buildings subject to special inspections, **FCCSS** approval, after review and approval by the appropriate **RDPs**, of the final report of special inspections submitted by the **SIER**.

Note: The above items may be in any order, but all are required prior to the following:

- Inspections Section, Fire Prevention Division of the Fire and Rescue Department. The **Owner** shall request shell occupancy inspection:
 - a. Prior to occupancy, for Groups A, E, H, I or R; or
 - b. Within five working days after occupancy, for Groups B, F, M, S or U.
- Building Inspections, Critical Structures Section, Commercial Inspections Division, DPWES. The **OWNER** shall request occupancy load posting inspection by **FCCSS** within

five working days after occupancy for rooms of assembly or education.

Note: The above items are required prior to:

- Environmental and Facilities Inspections Division, DPWES.

After all the above items are satisfied, application may be made for the Non-RUP.

SIFC-1707.2.2 Minimum building shell requirements for Non-RUP.

- a. Prior to issuance of a building shell Non-RUP, the following building, fire, and life safety features shall be completed:
 - Exit stairs;
 - Grade exit lobbies;
 - Grade exit corridors or passageways;
 - Elevator shaft enclosures;
 - Required exit lights and emergency lighting;
 - Elevator emergency recall system or elevators shall be locked out of service;
 - Required fireproofing of structural members in the core and occupied areas;
 - Firestopping of wiring, piping and other penetrations, both vertical and horizontal, in floors, ceilings and walls;
 - Removal of combustible trash and construction debris;
 - Storage areas complying with the Material Storage requirements (see SIFC-1706.2);
 - Firefighting, fire detection, and fire suppression systems complying with the fire protection and safety requirements for partially occupied buildings (see SIFC-1706).
- b. All sprinklers, standpipes, alarms, signaling systems and other required fire suppression or firefighting systems shall be activated throughout the entire structure prior to building shell Non-RUP. Under no conditions shall any fire suppression or firefighting system be shut off in any occupied area, unless the valve or other activation control mechanism is continuously manned, during the period the system is shut off. If this provision is deemed unworkable, any work shall be done after normal business hours. Subject to approval by the Fire Prevention Division and by **FCCSS**, a fire watch shall be instituted during the time any fire suppression or firefighting system is out of service, with the number of persons required for fire watch such that the entire building shall be checked every hour, except residential buildings of Groups R-1, R-2, R-3 and R-4, educational buildings of Group E and institutional buildings of Group I shall be checked every half hour. The **GC** shall submit a written record of fire watch activities to the Fire Prevention Division. The **GC** shall also notify the Fairfax County Emergency Operations Center when any fire suppression or firefighting system is placed out of service.
- c. The unoccupied portion of the building shall comply with the Fire Protection and Safety Requirements for Partially Occupied Buildings (see SIFC-1706).

SIFC-1707.2.3 Tenant space final inspections.

A Non-RUP for any tenant in a building may be obtained only after the following conditions have been met:

- a. A Non-RUP for a building shell has been issued.
- b. Interior work in this tenant's space, including any modifications to fire protection

systems, has been inspected and approved by the appropriate Fairfax County organizations:

- Electrical Inspections Section, Commercial Inspections Division, DPWES.
- Mechanical Inspections Section, Commercial Inspections Division, DPWES.
- Plumbing Inspections Section, Commercial Inspections Division, DPWES.
- Elevator Inspections (Mechanical Inspections Section), Commercial Inspections Division, DPWES.
- Fire Protection Systems Testing Section, Fire Prevention Division of the Fire and Rescue Department.
- Department of Health Services (applicable only to food establishments, medical buildings, health spas, etc.).

Note: The above items may be in any order, but all are required prior to the following:

- Inspections Section, Fire Prevention Division of the Fire and Rescue Department. The **Owner** shall request shell occupancy inspection:
 - a. Prior to occupancy, for Groups A, E, H, I or R; or
 - b. Within five working days after occupancy, for Groups B, F, M, S or U.
- Building Inspections, Critical Structures Section, Commercial Inspections Division, DPWES. The **OWNER** shall request occupancy load posting inspection by **FCCSS** within five working days after occupancy for rooms of assembly or education.

After all the above items are satisfied, application may be made for the Non-RUP.

- c. The unoccupied portion of the building shall comply with the fire protection and safety requirements for partially occupied buildings (see SIFC-1706).

Appendix A VUSBC(2000) Excerpts
Virginia Uniform Statewide Building Code (2000) Edition,
13 VAC 5-62-10 et seq., effective October 1, 2003
Amendments to IBC-2000

Change the following definitions to read:

Building. A combination of any materials, whether portable or fixed, having a roof to form a structure for the use or occupancy by persons or property. The word “building” shall be construed as though followed by the words “or part or parts thereof” unless the context clearly requires a different meaning. For application of this code, each portion of a building which is completely separated from other portions by fire walls complying with Section 705.0 shall be considered as a separate building.

Owner. The owner or owners of the freehold of the premises or lesser estate therein, a mortgagee or vendee in possession, assignee of rents, receiver, executor, trustee, or lessee in control of a building or structure.

Registered Design Professional (RDP). An architect or professional engineer, licensed to practice architecture or engineering, as defined under § 54.1-400 et seq. of the Code of Virginia.

Structure. An assembly of materials forming a construction for occupancy or use including stadiums, gospel and circus tents, reviewing stands, platforms, stagings, observation towers, radio towers, water tanks, storage tanks (underground and aboveground), trestles, piers, wharves, swimming pools, amusement devices, storage bins, and other structures of this general nature but excluding water wells. The word “structure” shall be construed as though followed by the words “or part or parts thereof” and “or equipment” unless the context clearly requires a different meaning.

Change IBC 2000 Sections 1704.1 and 1704.1.1 to read:

1704.1 General. Where application is made for construction as described in this section, the **Owner** or the **RDP** in responsible charge acting as the owner's agent shall employ one or more special inspectors to provide inspections during construction on the types of work listed under Section 1704. The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for inspection of the particular type of construction or operation requiring special inspection. These inspections are in addition to the inspections specified in Section 115.4.

Exceptions:

1. Special inspections are not required for work of a minor nature or as warranted by conditions in the jurisdiction as approved by the building official.
2. Special inspections are not required for building components unless the design involves the practice of professional engineering or architecture as defined by the laws of this Commonwealth and regulations governing the professional registration and certification of engineers or architects.
3. Unless otherwise required by the building official, special inspections are not required for

occupancies in Groups R-3, R-4 or R-5 and occupancies in Group U that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.

1704.1.1 Building permit requirement. The permit applicant shall submit a statement of special inspections prepared by the registered design professional in responsible charge in accordance with Section 111.5. This statement shall include a complete list of materials and work requiring special inspections by this section, the inspections to be performed and a list of the individuals, approved agencies or firms intended to be retained for conducting such inspections.

Add category 11 to Table 1704.4 to read:

TABLE 1704.4
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD	IBC REFERENCE
11. Inspection of concrete formwork, shoring and re-shoring.	—	X	ACI 318: 6.1, 6.2	1906

Appendix B IBC-2000 Excerpts

SECTION 202 DEFINITIONS

APPROVED. Acceptable to the building official.

CONSTRUCTION DOCUMENTS. Written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of a project necessary for obtaining a building permit.

CHAPTER 17

STRUCTURAL TESTS AND SPECIAL INSPECTIONS

SECTION 1701 GENERAL

1701.1 Scope. The provisions of this chapter shall govern the quality, workmanship and requirements for materials covered. Materials of construction and tests shall conform to the applicable standards listed in this code.

1701.2 New materials. New building materials, equipment, appliances, systems or methods of construction not provided for in this code, and any material of questioned suitability proposed for use in the construction of a building or structure, shall be subjected to the tests prescribed in this chapter and in the approved rules to determine character, quality and limitations of use.

1701.3 Used materials. The use of second-hand materials that meet the minimum requirements of this code for new materials shall be permitted.

SECTION 1702 DEFINITIONS

1702.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

APPROVED AGENCY. An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been approved.

APPROVED FABRICATOR. An established and qualified person, firm or corporation approved by the building official pursuant to Chapter 17 of this code.

CERTIFICATE OF COMPLIANCE. A certificate stating that materials and products meet specified standards or that work was done in compliance with approved construction documents.

FABRICATED ITEM. Structural, load bearing or lateral load-resisting assemblies consisting of materials assembled prior to installation in a building or structure, or subjected to operations such as heat treatment, thermal cutting, cold working or reforming after manufacture and prior to installation in a building or structure. Materials produced in accordance with standard specifications referenced by this code, such as rolled structural steel shapes, steel-reinforcing bars, masonry

units and plywood sheets, shall not be considered "fabricated items."

INSPECTION CERTIFICATE. An identification applied on a product by an approved agency containing the name of the manufacturer, the function and performance characteristics, and the name and identification of an approved agency that indicates that the product or material has been inspected and evaluated by an approved agency (see Section 1703.5 and "Label," "Manufacturer's Designation" and "Mark").

LABEL. An identification applied on a product by the manufacturer that contains the name of the manufacturer, the function and performance characteristics of the product or material, and the name and identification of an approved agency and that indicates that the representative sample of the product or material has been tested and evaluated by an approved agency (see Section 1703.5 and "Inspection Certificate," "Manufacturer's Designation" and "Mark").

MANUFACTURER'S DESIGNATION. An identification applied on a product by the manufacturer indicating that a product or material complies with a specified standard or set of rules (see also "Inspection Certificate," "Label" and "Mark").

MARK. An identification applied on a product by the manufacturer indicating the name of the manufacturer and the function of a product or material (see also "Inspection Certificate," "Label" and "Manufacturer's Designation").

SPECIAL INSPECTION. Inspection as herein required of the materials, installation, fabrication, erection or placement of components and connections requiring special expertise to ensure compliance with approved construction documents and referenced standards (see Section 1704).

SPECIAL INSPECTION, CONTINUOUS. The full-time observation of work requiring special inspection by an approved special inspector who is present in the area where the work is being performed.

SPECIAL INSPECTION, PERIODIC. The part-time or intermittent observation of work requiring special inspection by an approved special inspector who is present in the area where the work has been or is being performed and at the completion of the work.

SPRAYED FIRE-RESISTANT MATERIALS. Cementitious or fibrous materials that are spray-applied to provide fire-resistant protection of the substrates.

STRUCTURAL OBSERVATION. The visual observation of the structural system by a registered design professional for general conformance to the approved construction documents at significant construction stages and at completion of the structural system. Structural observation does not include or waive the responsibility for the inspection required by Section 109, Section 1704 or other sections of this code.

SECTION 1703 APPROVALS

1703.1 Approved agency. An approved agency shall provide all information as necessary for the building official to determine that the agency meets the applicable requirements.

1703.1.1 Independent. An approved agency shall be objective and competent. The agency shall also disclose possible conflicts of interest so that objectivity can be confirmed.

1703.1.2 Equipment. An approved agency shall have adequate equipment to perform required tests. The equipment shall be periodically calibrated.

1703.1.3 Personnel. An approved agency shall employ experienced personnel educated in conducting, supervising and evaluating tests and/or inspections.

1703.2 Written approval. Any material, appliance, equipment, system or method of construction meeting the requirements of this code shall be approved in writing after satisfactory completion of the required tests and submission of required test reports.

1703.3 Approved record. For any material, appliance, equipment, system or method of construction that has been approved, a record of such approval, including the conditions and limitations of the approval, shall be kept on file in the building official's office and shall be open to public inspection at appropriate times.

1703.4 Performance. Specific information consisting of test reports conducted by an approved testing agency in accordance with standards referenced in Chapter 35, or other such information as necessary, shall be provided for the building official to determine that the material meets the applicable code requirements.

1703.4.1 Research and investigation. Sufficient technical data shall be submitted to the building official to substantiate the proposed use of any material or assembly. If it is determined that the evidence submitted is satisfactory proof of performance for the use intended, the building official shall approve the use of the material or assembly subject to the requirements of this code. The cost offsets, reports and investigations required under these provisions shall be paid by the permit applicant.

1703.4.2 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources.

1703.5 Labeling. Where materials or assemblies are required by this code to be labeled, such materials and assemblies shall be labeled by an approved agency in accordance with Section 1703. Products and materials required to be labeled shall be labeled in accordance with the procedures set forth in Sections 1703.5.1 through 1703.5.3.

1703.5.1 Testing. An approved agency shall test a representative sample of the product or material being labeled to the relevant standard or standards. The approved agency shall maintain a record of the tests performed. The record shall provide sufficient detail to verify compliance with the test standard

1703.5.2 Inspection and identification. The approved agency shall periodically perform an inspection, which shall be in-plant if necessary, of the product or material that is to be labeled. The inspection shall verify that the labeled product or material is representative of the product or material tested.

1703.5.3 Label information. The label shall contain the manufacturer's or distributor's identification, model number, serial number, or definitive information describing the product or material's performance characteristics and approved agency's identification.

1703.6 Heretofore approved materials. The use of any material already fabricated or of any construction already erected, which conformed to requirements or approvals heretofore in effect, shall be permitted to continue, if not detrimental to life, health or safety to the public.

1703.7 Evaluation and follow-up inspection services. Where structural components or other

items regulated by this code are not visible for inspection after completion of a prefabricated assembly, the permit applicant shall submit a report of each prefabricated assembly. The report shall indicate the complete details of the assembly, including a description of the assembly and the assembly's components, the basis upon which the assembly is being evaluated, test results and similar information, and other data as necessary for the building official to determine conformance to this code. Such a report shall be approved by the building official.

1703.7.1 Follow-up inspection. The permit applicant shall provide for special inspections of fabricated items in accordance with Section 1704.2.

1703.7.2 Test and inspection records. Copies of necessary test and inspection records shall be filed with the building official.

SECTION 1704 SPECIAL INSPECTIONS

1704.1 General. Where application is made for construction as described in this section, the owner or the registered design professional in responsible charge acting as the owner's agent shall employ one or more special inspectors to provide inspections during construction on the types of work listed under Section 1704. The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for inspection of the particular type of construction or operation requiring special inspection. These inspections are in addition to the inspections specified in Section 109.

Exceptions:

1. Special inspections are not required for work of a minor nature or as warranted by conditions in the jurisdiction as approved by the building official.
2. Special inspections are not required for building components unless the design involves the practice of professional engineering or architecture as defined by applicable state statutes and regulations governing the professional registration and certification of engineers or architects.
3. Unless otherwise required by the building official, special inspections are not required for occupancies in Group R-3 as applicable in Section 101.2 and occupancies in Group U that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.

1704.1.1 Building permit requirement. The permit applicant shall submit a statement of special inspections prepared by the registered design professional in responsible charge in accordance with Section 106.1 as a condition for permit issuance. This statement shall include a complete list of materials and work requiring special inspections by this section, the inspections to be performed and a list of the individuals, approved agencies or firms intended to be retained for conducting such inspections.

1704.1.2 Report requirement. Special inspectors shall keep records of inspections. The special inspector shall furnish inspection reports to the building official, and to the registered design professional in responsible charge. Reports shall indicate that work inspected was done in conformance to approved construction documents. Discrepancies shall be brought to the immediate attention of the contractor for correction. If the discrepancies are not corrected, the discrepancies shall be brought to the attention of the building official and to the registered design professional in responsible charge prior to the completion of that phase of the work. A final report of inspections documenting required special inspections and correction of any discrepancies noted in the inspections shall be submitted periodically at a frequency agreed upon by the permit applicant and the building official prior to the start of work.

1704.2 Inspection of fabricators. Where fabrication of structural load-bearing members and assemblies is being performed on the premises of a fabricator's shop, special inspection of the fabricated items shall be required by this section and as required elsewhere in this code.

1704.2.1 Fabrication and implementation procedures. The special inspector shall verify that the fabricator maintains detailed fabrication and quality control procedures that provide a basis for inspection control of the workmanship and the fabricator's ability to conform to approved construction documents and referenced standards. The special inspector shall review the procedures for completeness and adequacy relative to the code requirements for the fabricator's scope of work.

Exception: Special inspections as required by Section 1704.2 shall not be required where the fabricator is approved in accordance with Section 1704.2.2.

1704.2.2 Fabricator approval. Special inspections required by this code are not required where the work is done on the premises of a fabricator registered and approved to perform such work without special inspection. Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by an approved special inspection agency. At completion of fabrication, the approved fabricator shall submit a certificate of compliance to the building official stating that the work was performed in accordance with the approved construction documents.

1704.3 Steel construction. The special inspections for steel elements of buildings and structures shall be as required by Section 1704.3 and Table 1704.3. Where required, special inspection of steel shall also comply with Section 1715.

Exceptions:

1. Special inspection of the steel fabrication process shall not be required where the fabricator does not perform any welding, thermal cutting or heating operation of any kind as part of the fabrication process. In such cases, the fabricator shall be required to submit a detailed procedure for material control that demonstrates the fabricator's ability to maintain suitable records and procedures such that, at any time during the fabrication process, the material specification, grade and mill test reports for the main stress-carrying elements are capable of being determined.
2. The special inspector need not be continuously present during welding of the following items, provided the materials, welding procedures and qualifications of welders are verified prior to the start of the work; periodic inspections are made of the work in progress; and a visual inspection of all welds is made prior to completion or prior to shipment of shop welding.
 - 2.1. Single pass fillet welds not exceeding $\frac{5}{16}$ inch (7.9 mm) in size.
 - 2.2. Floor and roof deck welding.
 - 2.3. Welded studs when used for structural diaphragm.
 - 2.4. Welded sheet steel for cold-formed steel framing members such as studs and joists.
 - 2.5. Welding of stairs and railing systems.

1704.3.1 Welding. Welding inspection shall be in compliance with AWS D1.1. The basis for welding inspector qualification shall be AWS D1.1.

1704.3.2 Details. The special inspector shall perform an inspection of the steel frame to verify compliance with the details shown on the approved construction documents, such as bracing, stiffening, member locations and proper application of joint details at each connection.

1704.3.3 High-strength bolts. Installation of high strength bolts shall be periodically inspected in accordance with AISC specifications.

1704.3.3.1 General. While the work is in progress, the special inspector shall determine that the requirements for bolts, nuts, washers, and paint; bolted parts; and installation and tightening in such standards are met. For bolts requiring pretensioning, the special inspector shall observe the pre-installation testing and calibration procedures when such procedures are required by the installation method or by project plans or specification; determine that all plies of connected materials have been drawn together and properly snugged; and monitor the installation of bolts to verify that the selected procedure for installation is properly used to tighten bolts. For joints required to be tightened only to the snug tight condition, the special inspector need only verify that the connected materials have been drawn together and properly snugged.

1704.3.3.2 Periodic monitoring. Monitoring of bolt installation for pretensioning is permitted to be performed on a periodic basis when using the turn-of-nut method with matchmarking techniques, the direct tension indicator method, or the alternate design fastener (twist-off bolt) method. Joints designated as snug tight need be inspected only on a periodic basis.

1704.3.3.3 Continuous monitoring. Monitoring of bolt installation for pretensioning using the calibrated wrench method or the turn-of-nut method without matchmarking shall be performed on a continuous basis.

SECTION 1902 DEFINITIONS

RESHORES. Shores placed snugly under a concrete slab or other structural member after the original forms and shores have been removed from a larger area, thus requiring the new slab or structural member to deflect and support its own weight and existing construction loads applied prior to the installation of the reshores.

SHORES. Vertical or inclined support members designed to carry the weight of the formwork, concrete and construction loads above.

**TABLE 1704.3
REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION**

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD ^a	IBC REFERENCE
1. Material verification of high-strength bolts, nuts, and washers:		X	Applicable ASTM material specifications;	
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	—		AISC ASD, Section A3.4; AISC LRFD, Section A3.3	—
b. Manufacturer's certificate of compliance required.				
2. Inspection of high-strength bolting:			AISC LRFD, Section M2.5	1704.3.3
a. Bearing-type connections.		X		
b. Slip-critical connections.	X	X		
Material verification of structural steel:				1708.4
a. Identification markings to conform to ASTM standards specified in the approved construction documents.			ASTM A 6 or ASTM A 568	
b. Manufacturers' certified mill test reports required.	—	—	ASTM A 6 or ASTM A 568	
4. Material verification of weld filler materials:				
a. Identification markings to conform to AWS specification in the approved construction documents.			AISC ASD, Section A3.6; AISC LRFD, Section A3.5	
b. Manufacturer's certificate of compliance required.	—	—		—
5. Inspection of welding:			AWS D1.1	1704.3.1
a. Structural steel:				
1) Complete and partial penetration groove welds	X			
2) Multi-pass fillet welds	X			
3) Single-pass fillet welds $> \frac{5}{16}$ " (7.9 mm)	X			
4) Single-pass fillet welds $< \frac{5}{16}$ " (7.9 mm)		X		
5) Floor and deck welds		X		
b. Reinforcing steel:			AWS D1.3 AWS D1.4 ACI 318: 3.5.2	1704.3.1
1) Verification of weldability of reinforcing steel other than ASTM A 706.		X		
2) Reinforcing steel-resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special reinforced concrete shear walls, and shear reinforcement.	X			
3) Shear reinforcement.		X		
4) Other reinforcing steel.	X			
6. Inspection of steel frame joint details for compliance with approved construction documents:		X		1704.3.2
a. Details such as bracing and stiffening.	—		—	
b. Member locations.				
c. Application of joint details at each connection.				

For SI: 1 inch = 25.4 mm.

a. Where applicable, see also Section 1707.1, Special inspection for seismic resistance.

1704.4 Concrete construction. The special inspections and verifications for concrete construction shall be as required by this section and Table 1704.4.

Exception: Special inspections shall not be required for:

1. Isolated spread concrete footings of buildings three stories or less in height that are fully supported on earth or rock.
2. Continuous concrete footings supporting walls of buildings three stories or less in height that are fully supported on earth or rock where:
 - 2.1. The footings support walls of light frame construction;
 - 2.2. The footings are designed in accordance with Table 1805.4.2; or
 - 2.3. The structural design is based on a f'_c no greater than 2,500 pounds per square inch (17.2 MPa).
3. Nonstructural concrete slabs supported directly on the ground, including prestressed slabs on grade, where the effective prestress in the concrete is less than 150 pounds per square inch (1.03 MPa).
4. Concrete foundation walls constructed in accordance with Table 1805.5(1), 1805.5(2), 1805.5(3) or 1805.5(4).
5. Concrete patios, driveways and sidewalks, on grade.

1704.4.1 Materials. In the absence of sufficient data or documentation providing evidence of conformance to quality standards for materials in Chapter 3 of ACI 318, the building official shall require testing of materials in accordance with the appropriate standards and criteria for the material in Chapter 3 of ACI 318. Weldability of reinforcement, except that which conforms to ASTM A 706, shall be determined in accordance with the requirements of Section 1903.5.2.

TABLE 1704.4
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD ^a	IBC REFERENCE
1. Inspection of reinforcing steel, including prestressing tendons, and placement.	—	X	ACI 318: 3.5, 7.1-7.7	1903.5, 1907.1, 1907.7, 1914.4
2. Inspection of reinforcing steel welding in accordance with Table 1704.3, Item 5B.	—	—	AWS D1.4 ACI 318: 3.5.2	1903.5.2
3. Inspect bolts to be installed in concrete prior to and during placement of concrete where allowable loads have been increased.	X	—	—	1912.5
4. Verifying use of required design mix.	—	X	ACI 318: Ch. 4, 5.2-5.4	1904, 1905.2-1905.4, 1914.2, 1914.3
5. Sampling fresh concrete and performing slump, air content and determining the temperature of fresh concrete at the time of making specimens for strength tests.	X	—	ASTM C 172 ASTM C 31 ACI 318: 5.6, 5.8	1905.6, 1914.10
6. Inspection of concrete and shotcrete placement for proper application techniques.	X	—	ACI 318: 5.9, 5.10	1905.9, 1905.10, 1914.6, 1914.7, 1914.8
7. Inspection for maintenance of specified curing temperature and techniques.	—	X	ACI 318: 5.11-5.13	1905.11, 1905.13, 1914.9
8. Inspection of prestressed concrete:				
a. Application of prestressing forces.	X		ACI 318: 18.18	—
b. Grouting of bonded prestressing tendons in the seismic-force-resisting system.	X	—	ACI 318: 18.16.4	
9. Erection of precast concrete members.	—	X	ACI 318: Ch. 16	—
10. Verification of in-situ concrete strength, prior to stressing of tendons in posttensioned concrete and prior to removal of shores and forms from beams and structural slabs.	—	X	ACI 318: 6.2	1906.2
11. Inspection of concrete formwork, shoring and re-shoring.	—	X	ACI 318: 6.1, 6.2	1906

a. Where applicable, see also Section 1707.1, Special inspection for seismic resistance.

1704.5 Masonry construction. Masonry construction shall be inspected and evaluated in accordance with the requirements of this section, depending on the classification of the building or structure or nature of occupancy, as defined by this code (see Tables 1604.5 and 1617.6).

Exception: Special inspections shall not be required for:

1. Empirically designed masonry, glass unit masonry, or masonry veneer designed by Section 2109, 2110, or ACI 530/ASCE 5/TMS 402 Chapters 5,6 or 7 when they are part of nonessential buildings (see Tables 1604.5 and 1617.6).
2. Masonry foundation walls constructed in accordance with Table 1805.5(1), 1805.5(2), 1805.5(3) or 1805.5(4).

1704.5.1 Empirically designed masonry, glass unit masonry and masonry veneer in essential facilities. The minimum inspection program for masonry designed by Chapter 14, Section 2109 or 2110, or by Chapter 5, 6 or 7 of ACI 530/ASCE 5/TMS 402, in essential facilities (see Table 1604.5 and Section 1616.2) shall comply with Table 1704.5.1.

1704.5.2 Engineered masonry in nonessential facilities. The minimum special inspection program for masonry designed by Section 2106, 2107 or 2108, or by chapters other than Chapters 5, 6, or 7 of ACI 530/ASCE5/TMS 402, in nonessential facilities (see Table 1604.5 and Section 1616.2) shall comply with Table 1704.5.1.

1704.5.3 Engineered masonry in essential facilities. The minimum special inspection program for masonry designed by Section 2106, 2107 or 2108, or by chapters other than Chapters 5, 6 or 7 of ACI 530/ASCE5/TMS 402, in essential facilities (see Table 1604.5 and Section 1616.2) shall comply with Table 1704.5.3.

**TABLE 1704.5.1
LEVEL 1 SPECIAL INSPECTION**

INSPECTION TASK	FREQUENCY OF INSPECTION		REFERENCE FOR CRITERIA		
	Continuous during task listed	Periodically during task listed	IBC section	ACI 530 / ASCE 5 / TMS 402 ^a	ACI 530.1 / ASCE 6 / TMS 602 ^a
1. As masonry construction begins, the following shall be verified to ensure compliance:					
a. Proportions of site prepared mortar.	—	X	—	—	Art. 2.6A
b. Construction of mortar joints.		X			Art. 3.3B
c. Location of reinforcement and connectors.		X			Art. 3.4
2. The inspection program shall verify:					
a. Size and location of structural elements.		X			3.3G
b. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction.		X		Sec. 1.15.4, 2.1.2	
c. Specified size, grade and type of reinforcement.		X		Sec. 1.12	Art. 2.4, 3.4
d. Welding of reinforcing bars.	X		Sec. 2108.9.2.11 Item 2	Sec. 2.1.8.6, 2.1.8.6.2	
e. Protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F).		X	Sec. 2104.3, 2104.4		Art. 1.8
3. Prior to grouting, the following shall be verified to ensure compliance:					
a. Grout space is clean.		X			Art. 3.2D
b. Placement of reinforcement and connectors.	—	X	—	Sec. 1.12	Art. 3.4
c. Proportions of site-prepared grout.		X			Art. 2.6B
d. Construction of mortar joints.		X			Art. 3.3B
4. Grout placement shall be verified to ensure compliance with code and construction document provisions.	X	—	—	—	Art. 3.5
5. Preparation of any required grout specimens, mortar specimens and/or prisms shall be observed.	X	—	Sec. 2105.3, 2105.4, 2105.5	—	Art. 1.4
6. Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified.	—	X	—	—	Art. 1.5

For SI: °C = (°F - 32)/1.8.

a. The specific standards referenced are those listed in Chapter 35.

**TABLE 1704.5.3
LEVEL 2 SPECIAL INSPECTION**

INSPECTION TASK	FREQUENCY OF INSPECTION		REFERENCE FOR CRITERIA		
	Continuous during task listed	Periodically during task listed	IBC section	ACI 530/ASCE 5/TMS 402 ^a	ACI 530.1/ASCE 6/TMS 602 ^a
1. From the beginning of masonry construction, the following shall be verified to ensure compliance:					
a. Proportions of site-mixed mortar and grout.		X			Art. 2.6A
b. Placement of masonry units and construction of mortar joints.		X	—		Art. 3.3B
c. Placement of reinforcement and connectors.		X		Sec. 1.12.3	Art. 3.4
d. Grout space prior to grouting.	X				Art. 3.2D
e. Placement of grout.	X				Art. 3.5
2. The inspection program shall verify:					
a. Size and location of structural elements.		X			3.3G
b. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction.	X			Sec. 1.15.4, 2.1.2	
c. Specified size, grade and type of reinforcement.		X		Sec. 1.12	Art. 2.4, 3.4
d. Welding of reinforcing bars.	X		Sec. 2108.9.2.11 Item 2	Sec. 2.1.8.6, 2.1.8.6.2	
e. Protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F).		X	Sec. 2104.3, 2104.4		Art. 1.8
3. Preparation of any required grout specimens, mortar specimens and/or prisms shall be observed.	X	—	Sec. 2105.3, 2105.4, 2105.5	—	Art. 1.4
4. Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified.	—	X	—	—	Art. 1.5

For SI: °C = (°F - 32)/1.8.

a. The specific standards referenced are those listed in Chapter 35.

1704.6 Wood construction. Special inspections of the fabrication process of wood structural elements and assemblies shall be in accordance with Section 1704.2.

1704.7 Soils. The special inspections for existing site soil conditions, fill placement and load-bearing requirements shall follow Sections 1704.7.1 through 1704.7.3. The approved soils report, required by Section 1802.2, shall be used to determine compliance.

Exception: Special inspections not required during placement of fill less than 12 inches (305 mm) deep.

1704.7.1 Site preparation. Prior to placement of the prepared fill, the special inspector shall determine that the site has been prepared in accordance with the approved soils report.

1704.7.2 During fill placement. During placement and compaction of the fill material, the special inspector shall determine that the material being used and the maximum lift thickness comply with the approved report, as specified in Section 1803.4.

1704.7.3 Evaluation of in-place density. The special inspector shall determine, at the approved frequency, that the in-place dry density of the compacted fill complies with the approved report.

1704.8 Pile foundations. A special inspector shall be present when pile foundations are being installed and during tests. The special inspector shall make and submit to the building official records of the installation of each pile and results of load tests. Records shall include the cutoff and tip elevation of each pile relative to a permanent reference.

1704.9 Pier foundations. Special inspection is required for pier foundations for buildings assigned to Seismic Design Category C, D, E or F in accordance with Section 1616.3.

1704.10 Wall panels and veneers. Special inspection is required for exterior and interior architectural wall panels and the anchoring of veneers for buildings assigned to Seismic Design Category E or F in accordance with Section 1616.3. Special inspection of such masonry veneer shall be in accordance with Section 1704.5.

1704.11 Sprayed fire-resistant materials. Special inspections for sprayed fire-resistant materials applied to structural elements and decks shall be in accordance with Sections 1704.11.1 through 1704.11.5. Special inspections shall be based on the fire-resistance design as designated in the approved construction documents.

1704.11.1 Structural member surface conditions. The surfaces shall be prepared in accordance with the approved fire-resistance design and the approved manufacturer's written instructions. The prepared surface of structural members to be sprayed shall be inspected before the application of the sprayed fire-resistant material.

1704.11.2 Application. The substrate shall have a minimum ambient temperature before and after application as specified in the approved manufacturer's written instructions. The area for application shall be ventilated during and after application as required by the approved manufacturer's written instructions.

1704.11.3 Thickness. The average thickness of the sprayed fire-resistant materials applied to structural elements shall not be less than the thickness required by the approved fire-resistance design. Individual measured thickness, which exceeds the thickness specified in a design by

$\frac{1}{4}$ inch (6.4 mm) or more shall be recorded as the thickness specified in the design plus $\frac{1}{4}$ inch (6.4 mm). For design thicknesses 1 inch (25 mm) or greater, the minimum allowable individual thickness shall be the design thickness minus $\frac{1}{4}$ inch (6.4 mm). For design thicknesses less than 1 inch (25 mm), the minimum allowable individual thickness shall be the design thickness minus 25 percent. Thickness shall be determined in accordance with ASTM E 605. Samples of the sprayed fire-resistant materials shall be selected in accordance with Sections 1704.11.3.1 and 1704.11.3.2.

1704.11.3.1 Floor, roof and wall assemblies. The thickness of the sprayed fire-resistant material applied to floor, roof and wall assemblies shall be determined in accordance with ASTM E 605, taking the average of not less than four measurements for each 1,000 square feet (93 m²) of the sprayed area on each floor or part thereof.

1704.11.3.2 Structural framing members. The thickness of the sprayed fire-resistant material applied to structural members shall be determined in accordance with ASTM E 605. Thickness testing shall be performed on not less than 25 percent of the structural members on each floor.

1704.11.4 Density. The density of the sprayed fire-resistant material shall not be less than the density specified in the approved fire-resistant design. Density of the sprayed fire-resistant material shall be determined in accordance with ASTM E 605.

1704.11.5 Bond strength. The cohesive/adhesive bond strength of the cured sprayed fire-resistant material applied to structural elements shall not be less than 150 pounds per square foot (7.18 kN/m²). The cohesive/adhesive bond strength shall be determined in accordance with the field test specified in ASTM E 736 by testing in-place samples of the sprayed fire-resistant material selected in accordance with Sections 1704.11.5.1 and 1704.11.5.2.

1704.11.5.1 Floor, roof and wall assemblies. The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from each floor, roof and wall assembly at the rate of not less than one sample for every 10,000 square feet (929 m²) or part thereof of the sprayed area in each story.

1704.11.5.2 Structural framing members. The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from beams, girders, joists, trusses and columns at the rate of not less than one sample for each type of structural framing member for each 10,000 square feet (929 m²) of floor area or part thereof in each story.

1704.12 Exterior insulation and finish systems (EIFS). Special inspections shall be required for all EIFS applications.

Exceptions:

1. Special inspections shall not be required for EIFS applications installed over a water-resistive barrier with a means of draining moisture to the exterior.
2. Special inspections shall not be required for EIFS applications installed over masonry or concrete walls.

1704.13 Special cases. Special inspections shall be required for proposed work that is, in the opinion of the building official, unusual in its nature, such as, but not limited to, the following examples:

1. Construction materials and systems that are alternatives to materials and systems prescribed by this code.

2. Unusual design applications of materials described in this code.
3. Materials and systems required to be installed in accordance with additional manufacturer's instructions that prescribe requirements not contained in this code or in standards referenced by this code.

1704.14 Special inspection for smoke control. Smoke control systems shall be tested by a special inspector.

1704.14.1 Testing scope. The test scope shall be as follows:

1. During erection of ductwork and prior to concealment for the purposes of leakage testing and recording of device location.
2. Prior to occupancy and after sufficient completion for the purposes of pressure difference testing, flow measurements, and detection and control verification.

1704.14.2 Qualifications. Special inspection agencies for smoke control shall have expertise in fire-protection engineering, mechanical engineering and certification as air balancers.

SECTION 1705 QUALITY ASSURANCE FOR SEISMIC RESISTANCE

1705.1 Scope. A quality assurance plan for seismic requirements shall be provided in accordance with Section 1705.2 for the following:

1. The seismic-force-resisting systems in structures assigned to Seismic Design Category C, D, E or F, per Section 1616.
2. Designated seismic systems in structures assigned to Seismic Design Category D, E or F.
3. The following additional systems in structures assigned to Seismic Design Category C:
 - 3.1. HVAC ductwork containing hazardous materials, and anchorage of such ductwork
 - 3.2. Piping systems and mechanical units containing flammable, combustible or highly toxic materials
 - 3.3. Anchorage of electrical equipment used for emergency or standby power systems.
4. The following additional systems in structures assigned to Seismic Design Category D:
 - 4.1. Systems required for Seismic Design Category C
 - 4.2. Exterior wall panels and their anchorage
 - 4.3. Suspended ceiling systems and their anchorage
 - 4.4. Access floors and their anchorage
 - 4.5. Steel storage racks and their anchorage, where the importance factor, I_p , determined in Section 1621.1.6, is equal to 1.5.
5. The following additional systems in structures assigned to Seismic Design Category E or F:
 - 5.1. Systems required for Seismic Design Categories C and D
 - 5.2. Electrical equipment.

Exceptions:

1. A quality assurance plan is not required for structures designed and constructed in accordance with the conventional construction provisions of Section 2308.
2. A quality assurance plan is not required for structures designed and constructed in accordance with the following:
 - 2.1. The structure is constructed of light wood framing or light gauge cold-formed steel framing; the design spectral response acceleration at short periods, S_{DS} , as determined in Section 1615.1, does not exceed 0.5g, and the height of the structure does not exceed 35 feet (10 668 mm) above grade; or
 - 2.2. The structure is constructed using a reinforced masonry structural system or reinforced concrete structural system; the design spectral response acceleration at short periods, S_{DS} , as determined

in Section 1615.1, does not exceed 0.5g, and the height of the structure does not exceed 25 feet (7620 mm) above grade; or

2.3. The structure is a detached one- or two-family dwelling not exceeding two stories in height; and

2.3.1. The structure is classified as Seismic Use Group I, as determined in Section 1616.2; and

2.3.2. The structure does not have any of the following plan irregularities as defined in Table 1616.5.1 or any of the following vertical irregularities as defined in Table 1616.5.2:

- a. Torsional irregularity
- b. Nonparallel systems
- c. Stiffness irregularity – extreme soft story and soft story
- d. Discontinuity in capacity – weak story.

1705.2 Quality assurance plan preparation. The design of each designated seismic system shall include a quality assurance plan prepared by a registered design professional. The quality assurance plan shall identify the following:

1. The designated seismic systems and seismic-force-resisting systems that are subject to quality assurance in accordance with Section 1705.1.
2. The special inspections and testing to be provided as required by Sections 1704 and 1708 and other applicable sections of this code, including the applicable reference standards referred to by this code.
3. The type and frequency of testing required.
4. The type and frequency of special inspections required.
5. The required frequency and distribution of testing and special inspection reports.
6. The structural observations to be performed.
7. The required frequency and distribution of structural observation reports.

1705.3 Contractor responsibility. Each contractor responsible for the construction of a seismic-force-resisting system, designated seismic system, or component listed in the quality assurance plan shall submit a written contractor's statement of responsibility to the building official and to the owner prior to the commencement of work on the system or component. The contractor's statement of responsibility shall contain the following:

1. Acknowledgment of awareness of the special requirements contained in the quality assurance plan.
2. Acknowledgment that control will be exercised to obtain conformance with the construction documents approved by the building official.
3. Procedures for exercising control within the contractor's organization, the method and frequency of reporting, and the distribution of the reports.
4. Identification and qualifications of the person(s) exercising such control and their position(s) in the organization.

SECTION 1706 QUALITY ASSURANCE FOR WIND REQUIREMENTS

1706.1 Scope. A quality assurance plan shall be provided in accordance with Section 1706.1.1.

1706.1.1 When required. A quality assurance plan for wind requirements shall be provided for all structures constructed in the following areas:

1. In wind exposure categories A and B, where the 3 second-gust basic wind speed is 120 mph or greater.
2. In wind exposure categories C and D, where the 3 second-gust basic wind speed is 110 mph or greater.

Exception: A quality assurance plan is not required for structures designed and constructed in accordance with the *International Residential Code* or the conventional construction provisions of

Section 2308 of this code, provided that all of the applicable items listed in Section 1706.1.2 are inspected during construction by a qualified person approved by the building official.

1706.1.2 Detailed requirements. When required by Section 1706.1.1, a quality assurance plan shall be provided for the following:

1. Roof cladding and roof framing connections.
2. Wall connections to roof and floor diaphragms and framing.
3. Roof and floor diaphragm systems, including collectors, drag struts, and boundary elements.
4. Vertical wind-force-resisting systems, including braced frames, moment frames and shear walls.
5. Wind-force-resisting system connections to the foundation.
6. Fabrication and installation of components and assemblies required to meet the impact resistance requirements of Section 1609.1.4.

Exception: Fabrication of manufactured components and assemblies that have a label indicating compliance with the wind-load and impact-resistance requirements of this code.

1706.2 Quality assurance plan preparation. The design of each main wind-force-resisting system and each wind-resisting component shall include a quality assurance plan prepared by a registered design professional.

Exception: For construction that is not required to be designed by a registered design professional, the quality assurance plan may be prepared by a qualified person approved by the building official.

The quality assurance plan shall identify the following:

1. The main wind-force-resisting systems and wind-resisting components that are subject to quality assurance in accordance with Section 1706.1.
2. The special inspections and testing to be provided as required by Section 1704 and other applicable sections of this code, including the applicable reference standards referred to by this code.
3. The type and frequency of testing required.
4. The type and frequency of special inspections required.
5. The required frequency and distribution of testing and special inspection reports.
6. The structural observations to be performed.
7. The required frequency and distribution of structural observation reports.

1706.3 Contractor responsibility. Each contractor responsible for the construction of a main wind-force-resisting system or a wind-resisting component listed in the quality assurance plan shall submit a written contractor's statement of responsibility to the building official and to the owner prior to the commencement of work on the system or component. The contractor's statement of responsibility shall contain the following:

1. Acknowledgment of awareness of the special requirements contained in the quality assurance plan;
2. Acknowledgment that control will be exercised to obtain conformance with the construction documents approved by the building official;
3. Procedures for exercising control within the contractor's organization, the method and frequency of reporting, and the distribution of the reports; and
4. Identification and qualifications of the person(s) exercising such control and their position(s) in the organization.

SECTION 1707 SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE

1707.1 Special inspections for seismic resistance. Special inspection as specified in this section is required for the following, where required in Section 1704.1. Special inspections itemized in Sections 1707.2 through 1707.8 are required for the following:

1. The seismic-force-resisting systems in structures assigned to Seismic Design Category C, D, E or F, as determined in Section 1616.
2. Designated seismic systems in structures assigned to Seismic Design Category D, E or F.
3. Architectural, mechanical and electrical components in structures assigned to Seismic Design Category C, D, E or F that are required in Sections 1707.6 and 1707.7.

1707.2 Structural steel. Continuous special inspection for structural welding in accordance with AISC Seismic.

Exceptions:

1. Single-pass fillet welds not exceeding $\frac{5}{16}$ inch (7.9 mm) in size.
2. Floor and roof deck welding.

1707.3 Structural wood. Continuous special inspection during field gluing operations of elements of the seismic-force-resisting system. Periodic special inspections for nailing, bolting, anchoring and other fastening of components within the seismic-force-resisting system, including drag struts, braces and hold-downs.

1707.4 Cold-formed steel framing. Periodic special inspections during welding operations of elements of the seismic-force-resisting system. Periodic special inspections for screw attachment, bolting, anchoring and other fastening of components within the seismic-force-resisting system, including struts, braces, and hold-downs.

1707.5 Storage racks and access floors. Periodic special inspection during the anchorage of access floors and storage racks 8 feet (2438 mm) or greater in height in structures assigned to Seismic Design Category D, E or F.

1707.6 Architectural components. Periodic special inspection during the erection and fastening of exterior cladding, interior and exterior nonload bearing walls, and veneer in structures assigned to Seismic Design Category D, E or F.

Exceptions:

1. Special inspection is not required for architectural components in structures 30 feet (9144 mm) or less in height.
2. Special inspection is not required for cladding and veneer weighing 5 pounds per square foot (24.4 kg/m²) or less.

1707.7 Mechanical and electrical components. Periodic special inspection during the anchorage of electrical equipment for emergency or standby power systems in structures assigned to Seismic Design Category C, D, E or F. Periodic special inspection during the installation of anchorage of other electrical equipment in structures assigned to Seismic Design Category E or F. Periodic special inspection during installation of piping systems intended to carry flammable, combustible, or highly toxic contents and their associated mechanical units in structures assigned to Seismic Design Category C, D, E or F. Periodic special inspection during the installation of HVAC ductwork that will contain hazardous materials in structures assigned to Seismic Design Category C, D, E or F.

1707.7.1 Component inspection. Special inspection is required for the installation of the following components where the component has a Component Importance Factor of 1.0 or 1.5 in accordance with Section 1621.1.6.

1. Equipment using combustible energy sources.
2. Electrical motors, transformers, switchgear unit substations and motor control centers.
3. Reciprocating and rotating-type machinery.
4. Piping distribution systems 3 inches (76 mm) and larger.
5. Tanks, heat exchangers and pressure vessels.

1707.7.2 Component and attachment testing. The component manufacturer shall test or analyze the component and the component mounting system or anchorage for the design forces in Chapter 16 for those components having a Component Importance Factor of 1.0 or 1.5 in accordance with Chapter 16. The manufacturer shall submit a certificate of compliance for review and acceptance by the registered design professional responsible for the design, and for approval by the building official. The basis of certification shall be by test on a shaking table, by three-dimensional shock tests, by an analytical method using dynamic characteristics and forces from Chapter 16 or by more rigorous analysis. The special inspector shall inspect the component and verify that the label, anchorage or mounting conforms to the certificate of compliance.

1707.7.3 Component manufacturer certification. Each manufacturer of equipment to be placed in a building assigned to Seismic Design Categories E and F, in accordance with Chapter 16, where the equipment has a Component Importance Factor of 1.0 or 1.5 in accordance with Chapter 16, shall maintain an approved quality control program. Evidence of the quality control program shall be permanently identified on each piece of equipment by a label.

1707.8 Seismic isolation system. Provide periodic special inspection during the fabrication and installation of isolator units and energy dissipation devices if used as part of the seismic isolation system.

SECTION 1708 STRUCTURAL TESTING FOR SEISMIC RESISTANCE

1708.1 Masonry. Testing and verification of masonry materials and assemblies prior to construction shall comply with the requirements of this section, depending on the classification of building or structure or nature of occupancy, as defined in this code (see Table 1604.5 or Section 1616.2).

1708.1.1 Empirically designed masonry and glass unit masonry in nonessential facilities. The minimum testing and verification prior to construction for masonry designed by Section 2109 or 2110, or by Chapter 5 or 7 of ACI 530/ASCE 5/TMS 402, in nonessential facilities (see Table 1604.5 or Section 1616.2) shall comply with Table 1708.1.1.

1708.1.2 Empirically designed masonry and glass unit masonry in essential facilities. The minimum testing and verification prior to construction for masonry designed by Section 2109 or 2110, or by Chapter 5 or 7 of ACI 530/ASCE 5/TMS 402, in essential facilities (see Table 1604.5 or Section 1616.2) shall comply with the requirements of Table 1708.1.2.

1708.1.3 Engineered masonry in nonessential facilities. The minimum testing and verification prior to construction for masonry designed by Section 2107 or 2108, or by chapters other than Chapter 5, 6 or 7 of ACI 530/ASCE 5/TMS 402, in nonessential facilities (see Table 1604.5 or Section 1616.2) shall comply with Table 1708.1.2.

1708.1.4 Engineered masonry in essential facilities. The minimum testing and verification prior to construction for masonry designed by Section 2107 or 2108, or by chapters other than Chapter 5, 6 or 7 of ACI 530/ASCE 5/TMS 402, in essential facilities (see Table 1604.5 or Section 1616.2) shall comply with Table 1708.1.4.

**TABLE 1708.1.1
LEVEL 1 QUALITY ASSURANCE**

MINIMUM TESTS AND SUBMITTALS
Certificates of compliance used in masonry construction

**TABLE 1708.1.2
LEVEL 2 QUALITY ASSURANCE**

MINIMUM TESTS AND SUBMITTALS
Certificates of compliance used in masonry construction
Verification of f'_m prior to construction, except where specifically exempted by this code.

**TABLE 1708.1.4
LEVEL 3 QUALITY ASSURANCE**

MINIMUM TESTS AND SUBMITTALS
Certificates of compliance used in masonry construction
Verification of f'_m prior to construction every 5000 square feet during construction.
Verification of proportions of materials in mortar and grout as delivered to the site.
For SI: 1 square foot = 0.0929 m ² .

1708.2 Testing for seismic resistance. The tests specified in Sections 1708.3 through 1708.6 are required for the following:

1. The seismic-force-resisting systems in structures assigned to Seismic Design Category C, D, E or F, as determined in Section 1616.
2. Designated seismic systems in structures assigned to Seismic Design Category D, E or F.
3. Architectural, mechanical and electrical components in structures assigned to Seismic Design Category C, D, E or F that are required in Section 1708.5.

1708.3 Reinforcing and prestressing steel. Certified mill test reports shall be provided for each shipment of reinforcing steel used to resist flexural, shear and axial forces in reinforced concrete intermediate frames, special moment frames and boundary elements of special reinforced concrete or reinforced masonry shear walls. Where ASTM A 615 reinforcing steel is used to resist earthquake-induced flexural and axial forces in special moment frames and in wall boundary elements of shear walls in structures assigned to Seismic Design Category D, E or F, as determined in Section 1616, the testing requirements of ACI 318 shall be met. Where ASTM A 615 reinforcing steel is to be welded, chemical tests shall be performed to determine weldability in accordance with Section 1903.5.2.

1708.4 Structural steel. The testing contained in the quality assurance plan shall be as required by AISC Seismic and the additional requirements herein. The acceptance criteria for nondestructive testing shall be as required in AWS D1.1 as specified by the registered design professional.

Base metal thicker than 1.5 inches (38 mm), where subject to through-thickness weld shrinkage strains, shall be ultrasonically tested for discontinuities behind and adjacent to such welds after joint completion. Any material discontinuities shall be accepted or rejected on the basis of ASTM A 435 or A 898 (Level 1 Criteria) and criteria as established by the registered design professional(s) in responsible charge and the construction documents.

1708.5 Mechanical and electrical equipment. Each manufacturer of designated seismic system components shall test or analyze the component and its mounting system or anchorage and shall submit a certificate of compliance for review and acceptance by the registered design professional in responsible charge of the design of the designated seismic system and for approval by the building official. The evidence of compliance shall be by actual test on a shake table, by three-dimensional shock tests, by an analytical method using dynamic characteristics and forces, by the use of experience data (i.e., historical data demonstrating acceptable seismic performance), or by more rigorous analysis providing for equivalent safety. The special inspector shall examine the designated seismic system and shall determine whether the anchorages and label conform with the evidence of compliance.

1708.6 Seismically isolated structures. For required system tests, see Section 1623.8.

SECTION 1709 STRUCTURAL OBSERVATIONS

1709.1 Structural observations. Structural observations shall be provided for those structures included in Seismic Design Category D, E or F, as determined in Section 1616, where one or more of the following conditions exist:

1. The structure is included in Seismic Use Group II or III.
2. The height of the structure is greater than 75 feet (22 860 mm) above the base.
3. The structure is in Seismic Design Category E and Seismic Use Group I and greater than two stories in height.
4. When so designated by the registered design professional in responsible charge of the design.
5. When such observation is specifically required by the building official.

Structural observations shall also be provided for those structures sited where the basic wind speed exceeds 110 miles per hour (3 second gust) determined from Figure 1609, where one or more of the following conditions exists:

1. The structure is included in category II or III according to Table 1604.5.
2. The height of the structure is greater than 75 feet (22 860 mm).

The owner shall employ a registered design professional to perform structural observation as defined in Section 1702.

Deficiencies shall be reported in writing to the owner and the building official. At the conclusion of the work included in the permit, the structural observer shall submit to the building official a written statement that the site visits have been made and identify any reported deficiencies which, to the best of the structural observer's knowledge, have not been resolved.

SECTION 1710 DESIGN STRENGTHS OF MATERIALS

1710.1 Conformance to standards. The design strengths and permissible stresses of any structural material that are identified by a manufacturer's designation as to manufacture and grade by mill tests, or the strength and stress grade is otherwise confirmed to the satisfaction of the building official, shall conform to the specifications and methods of design of accepted engineering practice or the approved rules in the absence of applicable standards.

1710.2 New materials. For materials that are not specifically provided for in this code, the design strengths and permissible stresses shall be established by tests as provided for in Section 1711.

SECTION 1711 ALTERNATIVE TEST PROCEDURE

1711.1 General. In the absence of approved rules or other approved standards, the building official shall make, or cause to be made, the necessary tests and investigations; or the building official shall accept duly authenticated reports from approved agencies in respect to the quality and manner of use of new materials or assemblies as provided for in Section 104.11. The cost of all tests and other investigations required under the provisions of this code shall be borne by the permit applicant.

SECTION 1712 TEST SAFE LOAD

1712.1 Where required. Where proposed construction is not capable of being designed by approved engineering analysis, or where proposed construction design method does not comply with the applicable material design standard, the system of construction or the structural unit and the connections shall be subjected to the tests prescribed in Section 1714. The building official shall accept certified reports of such tests conducted by an approved testing agency, provided that such tests meet the requirements of this code and approved procedures.

SECTION 1713 IN-SITU LOAD TESTS

1713.1 General. Whenever there is a reasonable doubt as to the stability or load-bearing capacity of a completed building, structure or portion thereof for the expected loads, an engineering assessment shall be required. The engineering assessment shall involve either a structural analysis or an in-situ load test, or both. The structural analysis shall be based on actual material properties and other as-built conditions that affect stability or load-bearing capacity, and shall be conducted in accordance with the applicable design standard. If the structural assessment determines that the load-bearing capacity is less than that required by the code, load tests shall be conducted in accordance with Section 1713.2. If the building, structure or portion thereof is found to have inadequate stability or load-bearing capacity for the expected loads, modifications to ensure structural adequacy or the removal of the inadequate construction shall be required.

1713.2 Test standards. Structural components and assemblies shall be tested in accordance with the appropriate material standards listed in Chapter 35. In the absence of a standard that contains an applicable load test procedure, the test procedure shall be developed by a registered design professional and approved. The test procedure shall simulate loads and conditions of application that the completed structure or portion thereof will be subjected to in normal use.

1713.3 In-situ load tests. In-situ load tests shall be conducted in accordance with Section 1713.3.1 or 1713.3.2 and shall be supervised by a registered design professional. The test shall simulate the applicable loading conditions specified in Chapter 16 as necessary to address the concerns regarding structural stability of the building, structure or portion thereof.

1713.3.1 Load test procedure specified. Where a standard listed in Chapter 35 contains an applicable load test procedure and acceptance criteria, the test procedure and acceptance criteria in the standard shall apply. In the absence of specific load factors or acceptance criteria, the load factors and acceptance criteria in Section 1713.3.2 shall apply.

1713.3.2 Load test procedure not specified. In the absence of applicable load test procedures contained within a standard referenced by this code or acceptance criteria for a specific material or method of construction, such existing structure shall be subjected to a test procedure developed by a registered design professional that simulates applicable loading and deformation conditions. For components that are not a part of the seismic load-resisting system, the test load shall be equal to two times the unfactored design loads. The test load shall be left in place for a period of 24 hours. The structure shall be considered to have successfully met the test requirements where the following criteria are satisfied:

1. Under the design load, the deflection shall not exceed the limitations specified in Section 1604.3.
2. Within 24 hours after removal of the test load, the structure shall have recovered not less than 75 percent of the maximum deflection.
3. During and immediately after the test, the structure shall not show evidence of failure.

SECTION 1714 PRECONSTRUCTION LOAD TESTS

1714.1 General. In evaluating the physical properties of materials and methods of construction that are not capable of being designed by approved engineering analysis or that do not comply with applicable material design standards listed in Chapter 35, the structural adequacy shall be predetermined based on the load test criteria established in this section.

1714.2 Load test procedures specified. Where specific load test procedures, load factors and acceptance criteria are included in the applicable design standards listed in Chapter 35, such test procedures, load factors and acceptance criteria shall apply. In the absence of specific test procedures, load factors or acceptance criteria, the corresponding provisions in Section 1714.3 shall apply.

1714.3 Load test procedures not specified. Where load test procedures are not specified in the applicable design standards listed in Chapter 35, the load-bearing and deformation capacity of structural components and assemblies shall be determined on the basis of a test procedure developed by a registered design professional that simulates applicable loading and deformation conditions. For components and assemblies that are not a part of the seismic load-resisting system, the test shall be as specified in Section 1714.3.1. Load tests shall simulate the applicable loading conditions specified in Chapter 16.

1714.3.1 Test procedure. The test assembly shall be subjected to an increasing superimposed load equal to not less than two times the superimposed design load. The test load shall be left in place for a period of 24 hours. The tested assembly shall be considered to have successfully met the test requirements if the assembly recovers not less than 75 percent of the maximum deflection within 24 hours after the removal of the test load. The test assembly shall then be reloaded and subjected to an increasing superimposed load until either structural failure occurs or the superimposed load is equal to two and one-half times the load at which the deflection limitations specified in Section 1714.3.2 were reached, or the load is equal to two and one-half times the superimposed design load. In the case of structural components and assemblies for which deflection limitations are not specified in Section 1714.3.2, the test specimen shall be subjected to an increasing superimposed load until structural failure occurs or the load is equal to two and one-half times the desired superimposed design load. The allowable superimposed design load shall be taken as the lesser of:

1. The load at the deflection limitation given in Section 1714.3.2.
2. The failure load divided by 2.5.
3. The maximum load applied divided by 2.5.

1714.3.2 Deflection. The deflection of structural members under the design load shall not exceed the limitations in Section 1604.3.

1714.4 Wall and partition assemblies. Load-bearing wall and partition assemblies shall sustain the test load both with and without window framing. The test load shall include all design load components. Wall and partition assemblies shall be tested both with and without door and window framing.

1714.5 Exterior window and door assemblies. The design pressure rating of exterior windows and

doors in buildings shall be determined in accordance with Section 1714.5.1 or 1714.5.2.

Exception: Structural wind load design pressures for window units smaller than the size tested in accordance with Section 1714.5.1 or 1714.5.2 shall be permitted to be higher than the design value of the tested unit provided such higher pressures are determined by accepted engineering analysis. All components of the small unit shall be the same as the tested unit. Where such calculated design pressures are used, they shall be validated by an additional test of the window unit having the highest allowable design pressure.

1714.5.1 Aluminum, vinyl and wood exterior windows and glass doors. Aluminum, vinyl and wood exterior windows and glass doors shall be labeled as conforming to AAMA/NWWDA/101/I.S.2. The label shall state the name of the manufacturer, the approved labeling agency and the product designation as specified in AAMA/NWWDA/101/I.S.2. Products tested and labeled as conforming to AAMA/NWWDA/101/I.S.2 shall not be subject to the requirements of Sections 2403.2 and 2403.3.

1714.5.2 Exterior windows and door assemblies not provided for in Section 1714.5.1. Exterior window and door assemblies shall be tested in accordance with ASTM E 330. Exterior window and door assemblies containing glass shall comply with Section 2403. The design pressure for testing shall be calculated in accordance with Chapter 16. Each assembly shall be tested for 10 seconds at a load equal to 1.5 times the design pressure.

1714.6 Test specimens. Test specimens and construction shall be representative of the materials, workmanship and details normally used in practice. The properties of the materials used to construct the test assembly shall be determined on the basis of tests on samples taken from the load assembly or on representative samples of the materials used to construct the load test assembly. Required tests shall be conducted or witnessed by an approved agency.

SECTION 1715 MATERIAL AND TEST STANDARDS

1715.1 Test standards for joist hangers and connectors.

1715.1.1 Test standards for joist hangers. The vertical load-bearing capacity, torsional moment capacity, and deflection characteristics of joist hangers shall be determined in accordance with ASTM D 1761, using lumber having a specific gravity of 0.49 or greater, but not greater than 0.55, as determined in accordance with AFPA NDS for the joist and hangers.

1715.1.2 Vertical load capacity for joist hangers. The vertical load capacity for the joist hanger shall be determined by testing three joist hanger assemblies as specified in ASTM D 1761. If the ultimate vertical load for any one of the tests varies more than 20 percent from the average ultimate vertical load, at least three additional tests shall be conducted. The allowable vertical load for a normal duration of loading of the joist hanger shall be the lowest value determined from the following:

1. The lowest ultimate vertical load from any test divided by 3 (where three tests are conducted and each ultimate vertical load does not vary more than 20 percent from the average ultimate vertical load).
2. The average ultimate vertical load for all tests divided by 6 (where six or more tests are conducted).
3. The vertical load at which the vertical movement of the joist with respect to the header is 0.125 inch (3.2 mm) in any test.
4. The allowable design load for nails or other fasteners utilized to secure the joist hanger to the wood members.

5. The allowable design load for the wood members forming the connection.

1715.1.3 Torsional moment capacity for joist hangers. The torsional moment capacity for the joist hanger shall be determined by testing at least three joist hanger assemblies as specified in ASTM D 1761. The allowable torsional moment for normal duration of loading of the joist hanger shall be the average torsional moment at which the lateral movement of the top or bottom of the joist with respect to the original position of the joist is 0.125 inch (3.2 mm).

1715.1.4 Design value modifications for joist hangers. Allowable design values for joist hangers that are determined by Item 4 or 5 in Section 1715.1.2 shall be permitted to be modified by the appropriate duration of loading factors as specified in AFPA NDS. Allowable design values determined by Item 1, 2 or 3 in Sections 1715.1.2 and 2305.1 shall not be modified by duration of loading factors.

1715.2 Concrete and clay roof tiles.

1715.2.1 Overturning resistance. Concrete and clay roof tiles shall be tested to determine their resistance to overturning due to wind in accordance with SBCCI SSTD 11 and Chapter 15.

1715.2.2 Wind tunnel testing. When roof tiles do not satisfy the limitations in Chapter 16 for rigid tile, a wind tunnel test shall be used to determine the wind characteristic of the concrete or clay tile roof covering in accordance with SBCCI SSTD 11 and Chapter 15.

Appendix C EMERGENCY INFORMATION CARD

EMERGENCY PHONE PROCEDURES

Post at each Job Phone Location

Dial 911 for POLICE - FIRE – AMBULANCE assistance

Dial 698-2900 - Poison Center

Be Ready to Provide the Following Information:

BASIC JOB SITE INFORMATION: (to be completed by Superintendent before posting at phone locations)

1. CONSTRUCTION SITE STREET ADDRESS
2. MAJOR CROSS STREETS
3. NAME OF GENERAL CONTRACTOR
4. TELEPHONE NUMBER FROM WHICH CALL IS BEING MADE (Usually Job Phone)

THE FOLLOWING SPECIFIC INFORMATION MAY BE REQUIRED BY THE EMERGENCY 911 DISPATCHER:

1. NAME OF PERSON MAKING THE CALL?
2. WHAT HAPPENED? (fall, cave in, structure collapse, electrical, bleeding, heart attack)
3. HOW MANY PERSONS INJURED?
4. CONDITION OF INJURED?
5. HELP/FIRST AID ALREADY STARTED?
6. LOCATION OF INCIDENT ON SITE.
7. PLACE OF ENTRY TO SITE
8. EQUIPMENT ASSISTANCE AVAILABLE.

REMAIN CALM!

LET THE DISPATCHER TELL YOU TO HANG-UP